20377YP

SEQUENCE LISTING

<110> Andrew Bett
       Volker Sandig
       Rima Youil

<120> IMPROVED HELPER DEPENDENT VECTOR SYSTEM
   FOR GENE THERAPY

<130> 20377YP

<140> 09/890,836
<141> 2001-08-03

<150> PCT/US00/02405
<151> 2000-01-31

<150> 60/138,134
<151> 1999-06-08

<150> 60/118,601
<151> 1999-02-04

<160> 17

<170> FastSEQ for Windows Version 4.0

<210> 1
<211> 15
<212> DNA
<213> Artificial Sequence

<220>
<223> Consensus sequence

<221> misc_feature
<222> (1)...(15)
<223> n = A,T,C or G

<400> 1
atttgnnnnn nnngc   15

<210> 2
<211> 10
<212> DNA
<213> Artificial Sequence

<220>
<223> Adenovirus 5

<400> 2
attttgtgtt   10

<210> 3

- 1 -

```
<211> 10
<212> DNA
<213> Artificial Sequence

<220>
<223> Consensus sequence

<400> 3
attttgttgt                                                           10

<210> 4
<211> 158
<212> DNA
<213> Artificial Sequence

<220>
<223> Synthetic packaging signal

<400> 4
gtacacagga agtgactttt aacgcgcggt ttgttacgga tgttgtagta aatttgtcta     60
gggccgagta agatttgacc gtttacgcgg ggactttgaa taagagcgag tgaaatctga    120
ataattttgt tgtactcata gcgcgtaatc tctagacg                            158

<210> 5
<211> 158
<212> DNA
<213> Artificial Sequence

<220>
<223> Adenovirus 5

<400> 5
gtacacagga agtgacaatt ttcgcgcggt tttaggcgga tgttgtagta aatttgggcg     60
taaccgagta agatttggcc attttcgcgg gaaaactgaa taagaggaag tgaaatctga    120
ataattttgt gttactcata gcgcgtaatc tctagacg                            158

<210> 6
<211> 65
<212> DNA
<213> Artificial Sequence

<220>
<223> Linker

<400> 6
agctcggccg attattggcg cgccagatct gcggccgctt ctagaaacgc gtgaattcgg     60
cgcca                                                                65

<210> 7
<211> 65
<212> DNA
<213> Artificial Sequence

<220>
<223> Linker
```

<400> 7
agcttggcgc cgaattcacg cgtttctaga agcggccgca gatctggcgc gccaataatc   60
ggccg   65

<210> 8
<211> 40
<212> DNA
<213> Artificial Sequence

<220>
<223> PCR Primer

<400> 8
attggcgcgc cttctttctg ggatgattca gcatcaactc   40

<210> 9
<211> 41
<212> DNA
<213> Artificial Sequence

<220>
<223> PCR Primer

<400> 9
gatcgtcggc cgcttgggtc atagacttct ttgagaacca g   41

<210> 10
<211> 41
<212> DNA
<213> Artificial Sequence

<220>
<223> PCR Primer

<400> 10
atcagttagc ggccgcacaa gctaagatca caaagctgtt t   41

<210> 11
<211> 37
<212> DNA
<213> Artificial Sequence

<220>
<223> PCR Primer

<400> 11
tatggcgcgc cgctgacacc cagcctgggt gccggtg   37

<210> 12
<211> 39
<212> DNA
<213> Artificial Sequence

<220>

```
<223> PCR Primer

<400> 12
tcgacgcgta gcgctgtgtg gccttggcag tttccatag                    39

<210> 13
<211> 45
<212> DNA
<213> Artificial Sequence

<220>
<223> PCR Primer

<400> 13
tcagtaatgc ggccgcggga tcattcctgg actcagattg ttctg            45

<210> 14
<211> 41
<212> DNA
<213> Artificial Sequence

<220>
<223> PCR Primer

<400> 14
tattaaggcg ccgggcatgg gagtgatctc accaactctg g                41

<210> 15
<211> 46
<212> DNA
<213> Artificial Sequence

<220>
<223> PCR Primer

<400> 15
tcgacgcgta tttaaatgtg ctggagtgtt gagatactgt agtggt           46

<210> 16
<211> 28068
<212> DNA
<213> Artificial Sequence

<220>
<223> Modified adenovirus

<400> 16
aaacatcatc aataatatac cttattttgg attgaagcca atatgataat gagggggtgg    60
agtttgtgac gtggcgcggg gcgtgggaac ggggcgggtg acgtagtagt gtggcggaag   120
tgtgatgttg caagtgtggc ggaacacatg taagcgacgg atgtggcaaa agtgacgttt   180
ttggtgtgcg ccggtgtaca caggaagtga caattttcgc gcggttttag gcggatgttg   240
tagtaaattt gggcgtaacc gagtaagatt tggccatttt cgcgggaaaa ctgaataaga   300
ggaagtgaaa tctgaataat tttgtgttac tcatagcgcg taatatttgt ctagggccgc   360
ggggactttg accgtttacg tggagactcg cccaggtgtt tttctcaggt gttttccgcg   420
ttccgggtca agttggcgt tttgattcgg ccgcttgggt catagacttc tttgagaacc   480
```

-4-

```
agttataagc tatggtttct ctccacagaa aaagcactta tggtgtctcc ccctttccag    540
cccaccaaca ttttacatct aatttggggg ggttttctgg accacttaat acccatccat    600
ggatctcatg tgaagactcc cctggcttga gaaatcactg tcttgttgaa aatgggaaca    660
aagctaagtc agatagctgg ttcatcagca atgactttga ccaagcctga tcccacccta    720
ccccacccca ccccagtgac cacccccccac aatggagcac acaactctaa actggtttgt    780
aggtatgtgt gtgtgaacac gctgaggaat ctgcaaaacc aaatggtgag tgcaaaacca    840
aacagtcacg agtaaatctc acaacaacca cgtcctgagc tgcagccctt gttgaactat    900
accccactag ggccccaaga ttttaggact tgtgtgtggg tgggacctcc cctttctatc    960
atgctttaga agacagggat ttcaccagaa ttgaacatat tgaacatatg acccattttt   1020
ttcagccaaa ggcaattaaa ataacttcat acttgatatc catgtcagca aaagctgcaa   1080
aacgcaaatg ggtggctgct aagagccctg gtaccctgac gagcacacca agtgcttagc   1140
aacagtggtg tccaaaggac cagctggaag cctgccttga tgagaagttg ctcttctttc   1200
tacatgaagg aacacctcta ctctcctgct tttaatacct gagctgtgag tgatcatcta   1260
tgtccattag caaacatccc agtggagaag gaaacactca tacccgaaat ctaagctaca   1320
tagttggaat cacttcaact tattgcaata aacacttact aagcacctat tgtgggcaag   1380
tctttgcaat ggataatagt tcagtagata ttttgatgta atatttgaaa taacaataaa   1440
aattgccacc actgaattta ttgagcattt gctgtgcttt aggcactaac ccaggttctt   1500
taaatatttg gtcttattcg atctgtataa atagccatct atgagaaagg gactattatt   1560
gcccttattt tacaaatgag gccaatgagg cccagagagg ttaactaagt tgcccaaaat   1620
catacagccc actagtggca gagcaggatg caaacccagg cttgcctcgt tcccaagccc   1680
acatgtcgtt tgcattggtg tggaggtgtg catgtgttta gtcattagca tgttatatga   1740
taagcaagtt ttgaaacata gaaacttaaa atgtgccatt aagaaaagta caggcaaggt   1800
tttccaaggg gaggtgtgga cctccggaca aattttttaag aactaattat aaatacttaa   1860
aaatgggaat aagaagacaa cctaactacc tgaacagttt tagagatgac tcatgcccac   1920
cctctaaaac ccaaacaaaa acaacaaagt caagaaaacc catgaaatct tagcaagcga   1980
tttctatgta cttgtgaaaa ggatttcttt accattctaa tgggatttat gccaaccata   2040
gagggctcag tgcccctccc atggggtggt tagtgagtac agagctgagc tcaccggcca   2100
tctgcagctt catgttatca agctccagtt tgtccttgga gcaaggttat ctgggacatg   2160
agcagaggca ttgctttctg caatggacag ttctttctgc ctgcatacct agctccttga   2220
taactttaaa taccatttta tagccacact ggagttttga agacctcaat atgcaaatat   2280
tactcaggtt ctgattactt gtctgctcca tgataacaca ctctaaaagc aatgaatggg   2340
gcttatttgt agagaactga agcattttaa gcttttgctc aggaatccct ggtagcttcc   2400
tgtgacttgc aagatattag tgatgggtca agaaacagga ccccccatca gcataacata   2460
cgcagtgcct cagtagtcca tcaggcagaa aaaactgcag atggcacatg gaaatgacca   2520
gcggcggaag ataccccgac agtgtgggca gttctatttc agcagcaatc aagagggggc   2580
ctggagccac tcaatcaagt ggagcaggat gggagcaagc actgtgcaga ccaatgcaat   2640
ccccagttaa cacaaaaaat aaataaaaga gatgagattc agtctcttga ctgtgactga   2700
ctgggagctt tatagctgat gcttgtgtct tttctccatt ttatttaatt aggaaaagaa   2760
atgcttatca cacactctac gtgtgaggta caacctccac aggaaaggtt gttaggaaca   2820
tttcaacttc tagaagtttc taaacataag gtaaatccat ctttgtcctt gggatcactg   2880
cacatctcag aaaggcaaat aaatcagtaa ttggtgggca taattactag ctcatggact   2940
gacaaggtct acactatttc gaatctcaca gaagtaagcc atgggacaga tagagtctga   3000
tagtggtgcc ccgtttcctg gaggtcacac ttactcatcc ccctggaccc tgggcttctc   3060
atgattgtca gagagtttgc tggaaccagg tcagcccagt ttcccttccc ctgaaaaatc   3120
ctccaatggc tcgcaccaag actagagatg caagtgcaag cacatccacc ctctcagcag   3180
ccaggttttg cgttccataa tgtcacgtac ccccagtcat accaatctcc ttggagctct   3240
ccagacaggc tgccatgtgt ggtcggccct ctgtgcttgt gctccttggt ttgccaagcc   3300
tggaatgccc tttctccatg attgtactct gggaattctg tgtgtctttc gagatgaagc   3360
tcctccaccc tggaaattct gcctctcttt ccaggtccag ctcctgtggc tgaataccct   3420
tggctgactg aacattcttg ctgggccaag tcttaatcat ctctaaatcc ctctggtgcc   3480
ccgacagtat ctagcccagg caaagggctc agcaaatact tgcaaaattc aataaacttt   3540
actatgttac tagcttggca tgatgttcta ggcacttggg agattataat ctggtgagca   3600
ttgtgctagt ctttttttttg ggataaacac caatgataaa ctgagccttt actctcattt   3660
tagcacatct actcatctct tttcaatgct ggtgggttta taaacccat cagtagaaca   3720
gagagtgatc ataatcatat ggtgaaaata acatcagcta acatatttac tgaacatgct   3780
```

-5-

```
ttagtgtgct gggcactgaa ctctgtgcac atgtgaattt gagatagatt gttcctagct   3840
aataagatga ggaagtggag atgggcttac tcaagtcaca caatagcaag atggggtaca   3900
gacagaaacc aagctagaaa ccaagcaacc cctgggtttg gaaatgcatg ggctcctcct   3960
ctgcacatgg cgaggagcag tcaggtgctc ctccttctct catactgaaa taactctgca   4020
cttttggcta ttctgtgaca ctctgtgcta ttctgtagct caaatggctc tggtgcaagg   4080
agctcagatt atgactaacc cccatagata ttcagctgct ttgcaagaag tggatgaatg   4140
ctctggcttt ataaattatt gactagattg gatattggcc caatctccac tctggtgatt   4200
cggaaggagg catatgcaca tttgcaaggt tatagtagtg cactctaatt ccactggctt   4260
ctgagagctt gtaggtttct tgacttaatc attctggaat taaggtaatg gatcctcaac   4320
accttttctt tccctggcct ttactaacca tgtaacagaa atgagcagag aaaacccaag   4380
aaagcgaact ggagacttga tgagtgtgtc aaagatgctc agagtccaag gtcctctgtg   4440
gctcactgac ttcagaagcc aacctccgtt gttcaagtca cttgtgaggt tactatgcta   4500
gagcactaaa tattatccag atagcccaaa gaggtgaagg cagacatgtg gaagaacctg   4560
gattttggg caagttgatg aatgcctcct gccccatatc aaagagaggt gataggagac   4620
aactttgtga atttgaaata atgcaccggg gaaacaggaa aacgtaatgt aagtcacgct   4680
tcttggcttt tttcttgcca ttaccctact tggccaagtg caaatgggat ttcaatatat   4740
cataagtatg catctattaa taacaatgca agaaagctgt acaactgaag tctgagattt   4800
tgtaagaaac agaatctctg taagcatcac catccaacag aacttcctga gttgatgctg   4860
aatcatccca gaaagaaggc gcgccagctc tgcaggatct tcaagtctgg ggtgccacca   4920
gcaagcgacg gtcctccatg ggctcttcac cttacggcag tgtccagagg caccgccagt   4980
cctctgctcc tatgctggtc ctgctgtccc tggcaaaagg agccagagca ttctctccag   5040
gcctcccgag gaggctgctt cctttgtttt gcagatggag gctcccatcc tttgttctga   5100
atcaatgtgc tccaaagata agccccaaga aaacagttgt tgccttttga cactgacaat   5160
tagaatcgtt ggaaaatgga gaaaacagga aatggcaaat ggtttcagtg accaggagga   5220
aaccgtgcct gaaagttgct gcttagtgac tgggacactc gctttctgct ctcttatgaa   5280
ggacagccta ggccgtgtgg ccttttataa acaaagctat gaaggggtcg tcaaattttc   5340
tagggctgca actgtggcac tacgtcctgt tgtgccaggt gacactgaca agcagcactg   5400
agttctatgc aagcccaggt gtgcttctct catggtgacc cccagagaac taaggcccag   5460
ctcttcctct gtcacacccc tcccagcccc cactgtcaga caagggacca cattcacaga   5520
cagtctcagc caagatggca accttggaag tcctggggat gcctttctag aagctttagg   5580
ctgacgccag ggagctgtaa agcccccacc tgtccctggg ggttgtgtgc tgggcaggag   5640
agagggggaaa gagcccaaac tccaccactg cctgctggca caactgagcc cacgccaggc   5700
actgcaccag cttcactcac cagctaccac atgctaatgt ctcctgttta cccaggtgca   5760
atcacctgag tgctgctttc tcaccactgc atgggaagaa cgatctcatt accaattcaa   5820
ccacttaagc aggcaaaagg actccaacgg gggaaaggca gaggacaaac gattcgggga   5880
ctgagacaga tgcccacaaa atgttcctgg attttagccg gattcgggct gaagttcctt   5940
gccctatgag cccttggagg agagcatcct gactcagaca agaattcaaa tgacaagact   6000
tctggggggat ggcagtgaat ggatccaaag ccttgtttta taaagaatgt ggaggaaggg   6060
aggaaggaag ggagggaagg ggagactgag agggagagag aataaagaag aggaagagaa   6120
ggaagaggag gaggaggaag gggaggggag aggaaaaagg ggagggtaga ggaggaggga   6180
gaaggggaag ggaggacaga agaggggagg gagcggggag attatctacc cctccatgct   6240
agggaactcc tgtctccttt tccagcagac actgctccat gagtgccccc acagagagcc   6300
agcctgccac acagcagaag gtgctcagct atctgtccca aaggttgagc actagtgtat   6360
accacaagga aaaaaacctt cttttgtact gtttggaagc cagaattaga aacaactcgt   6420
tcacccttct gactttccct ttgcaatgac aggaagatag tatactgcat gggaccacca   6480
cacattcaag atctgagttg tggggacccc cacccccaca tgggtggagc ccctgagac   6540
ccgtgggctc tgactggcca tggcccatag atagtgacaa catacacact gctatctgaa   6600
gcctagttgg aggacggatg gatgctttta ggaaaaaatt ccctttagtc gtccctcaga   6660
aactacaacg gcttcctaaa atgaatggca ggcaagtttt gattgtttcc taagttcccc   6720
ctaactctca gagcctgtga ctcagcttct ccagaatgcc tgcagggagg caggaccact   6780
gggagtaatg agcacgaatt gggccacttc tcccagtgga ctgttaacgc cgagatctgg   6840
ggtggaaccc actgaacacc tgcccttttg cgttgcccag aatgcagcca gagggatacg   6900
ggccacagta actctggggc ccctgaacct accttcccaa gaccctgacg ggaaggtatt   6960
gcttacatga cagtccagtc agtccctctg tcactcagtt aacaaacatg gtcatgggtc   7020
tactatgggc caggctctgt tccgggcatg gggataacac cgtgtgtctc tactcttatg   7080
```

```
gacacaagta aatcaatcaa agcagataat gttctaatga ccacccagta gggtgaaggg    7140
atggagggtg ggcaggtgct ggcagaaacc taaggtcaag tcatgggacc ccaatggggga   7200
actggaaact gccacaccat tttctatgtt aggggtcttt ccttgcccct ctagagacct    7260
cacccatggt aatgatgctg ccctcaggtt tgaactggtc tgaagctgtc actgggggct    7320
tcacaaaatg aatgccactg aaagcaaacg gcagagatct gtatatgaaa ttctttttac    7380
cctttgtttt ctgtcttccc acatgatcta tgactgctgc aaactctatt ctgactcctc    7440
ctcagtcttg gccggtctgg gaagaacttg gtttagatgc tgggaatgat cccgggcaaa    7500
ggaaacaaat atatttccag cttgctttc ttcttcccct gtggtgcctg catcctctgt      7560
ctcgcactga ctcacaggct ggactgacaa agtggctgtg ttgacaggga ggatttagtg    7620
gatgccaggc ctgaccctca aaggccctca ggtggggcca atttccaagg ttcttagaga    7680
agatttgggg ccacaaatct gctctgccac ttcactgctg ggtgaaagct gttggcttga    7740
gaagagagag aataggtgag ggacaataat tctcaaggca agctagctga tatcctttca    7800
tttgtggctt ccaaagacag ggaaaggcaa ggcagaccag ggtggaaaca gcgacatcct    7860
gaggggacga cgtccgtttt gctaattctg tttccctggc agctttgtgc tggacaagat    7920
ttctctggtt tcagctgaag agtgaacagc tgaggagctc tgtgactctg agagagagag    7980
aaatcaatag cccttgaaag gaaagcactg cttgttcttc caggccaggg caggcaggat    8040
aaagagaaca aggctgtaca taccaaagcc gaatttccat taaaggccag aatcctggga    8100
ggccctttca gcttaatgac catcttctga tcactatcac ttagaaaatg ttcatgtctc    8160
cagttttctc tgcagatagt gcagacatcc tgtgcacatt gatattttat gcaccagatg    8220
caattctctg caaaggtccc ctctggctgg tgtccatccg cttgctctca tgaccactga    8280
tgcgactctg ggggcaagtc aagccattcc ttctagactc tagaatctag aggatgatcc    8340
caactcacag gcctcttgga caagcttgct ttggattcct tctgcctgta ctacccagac    8400
tgccagtcct ccagcagggc aatccaactt cctgcctcta gggtgtggga gtcctgggcg    8460
gggtttggaa tccacagcag atggctggca ggagaggcag ttcccgagca cccactaggt    8520
gccaagcagg caggtatcag gtgcagggct tcggaggtgc agaagcacag cccctgtccc    8580
cctcaggttc ccagtctggc ctcagggaca gacaggcagg taggtatgga aacggggtac    8640
tggaaggcat acagctgagg gagagagcag ctgcaccctg gtcaatcccc cactcatttc    8700
cctggaggtg gggctgaggc acctggagca ctctgcttgc ttgggttgtc cctttgccaa    8760
agaatgccgg gcagaaagta gagaacaagc aggcccagga agcactagaa gtccctcatg    8820
ggtggacaga gctttacctt cggagctgtc acctcctgtg ttcctcccaa caaccctgtg    8880
aggcaggcgg gcaggctgag caggggactg tgccccgttg acagatgagg aaagcgaggc    8940
tcagggggaa gtgacttacc tgtggcgtcg cagctaggca gtagtggagc gggcacctgc    9000
ctccaggcct tcggatccca gctgccccag ggcgctgcct ctgaggtgct gtacgaggag    9060
gtgactcggg ccagctcatg agcaaaggag ctgccgggca ggaaggactc actccccagg    9120
gcctggcagg acggggggctg tcgcccgagg ctgacctggg ggtgcctggc ttccccaagc   9180
ttgcaggctt tgtctacatg agtctacaac aaccgattga acaatccatc agctgcttgg    9240
ccacaaaatg gttctgactg atcttgtcac tgccctgagt gtctagctgg gtcatctggg    9300
tgttgtggtt atacccacca actgctttgg tggaacgaaa ccgcggccgc gggatcattc    9360
ctggactcag attgttctga agaagcccag ttctgggtgg catcaagtgc ttgctagatg    9420
gggggcttgc cttgatccgg ctacacttgg aggtgacttg ttcttggacg gctacataca    9480
gaaagagaga agtgggggatg agttccaaag gcatcctcga cttcggctgt ggccaccgga    9540
gggtagctcc tggcccaaca cggacttctc acctcccgcc cttggctctc tactgagctc    9600
cccctgctc cccaattcct cgccattccc ctcatttctc tgccctcagc ctggactgca     9660
gttcttctgg gaagctgccc caactcccta ggtctgtgct caccaagagc agatcacact    9720
ggactgaaat gccagctgat ttgtctcttc aagaaaattg gaagctcctg gaggtcaggg    9780
tccatgtctc cttttacact cagtgctctg tatgcaggcc tggcactgcc caccctttga    9840
caggtggtgc atattttgta gaaggaagga aggggccagg tggggtgggc tgggctggtg    9900
gcgggagcta gctcagcctc ttagattctc tacccgatgg atgtgacctg ggacagcaag    9960
tgagtgtggt gagtgagtgc agacggtgct ttgttcccct cttgtctcat agcctagatg   10020
gcctctgagc ccagatctgg ggctcagaca acatttgttc aactgaacgg taatgggttt   10080
cctttctgaa ggctgaaatc tgggagctga cattctggac tccctgagtt ctgaagagcc   10140
tggggatgga gagacacgga gcagaagatg gaaggtagag tcccaggtgc ctaagatggg   10200
gaatacatct cccctcattg tcatgagagt ccactctagc tgatatctac tgtggccaat   10260
atctaccggt acttttttgg ggtggacact gagtcatgca gcagtcttat ggtttaccca   10320
aggtcaggta ggggagacag tgcagtcaga gcacaagccc agtgtgtctg acccacccaa   10380
```

-7-

```
gaatccatgc tcgtatctac aaaaatgatt ttttctcttg taatggtgcc taggttcttt   10440
tattatcatg gcatgtgtat gttttcaac taggttacaa tctggcctta taaggttaac   10500
ctcctggagg ccaccagcct tcctgaaact tgtctgtgct gtccctgcaa ctggagtgtg   10560
cctgatgtgg cactccagcc tggacaagtg ggacacagac tccgctgtta tcaggcccaa   10620
agatgtcttc cataagacca gaagagcaat ggtgtagagg tgtcatgggc tacaataaag   10680
atgctgacct cctgtctgag ggcaagcagc ctcttctggc cctcagacaa atgctgagtg   10740
ttcccaagac taccctcggc ctggtccaat ctcatcccac tggtgcgtaa gggttgctga   10800
actcatgact tcttggctag cctgcaacct ccacggagtg ggaactacat caggcatttt   10860
gctaactgct gtatcctagg ccaataaatg ttgatcacat ttatagctgc catggtaggg   10920
tggggacccc tgctatctat ctgtggaggc tctgggagcc cctgacacaa actttctgaa   10980
gcagagcctc cccaacccct tttccattcc ctatacctga cagatggccc aggaacccat   11040
tagaaatgga aggtcactgc agcagtatgt gaatgtgcgt gtgggagaag ggcaggatca   11100
gagccctggg ggtgtggcag cccccaagtg attctaatcc agatcctagg gttgtttccc   11160
tgtcccattg aaatagctgc tttaaggggc ctgactcagg gaaatcagtc tcttgaatta   11220
agtggtgatt ttggagtcat ttagaccagg ccttcaattg ggatcctgct cttagagttg   11280
gatgaattat ttaactgatt ttcagatctc ctctttctca atgctttcag aagcacagta   11340
actgcttact ctgaaatgaa ttctcacccc acttccacat atgcacccct tgcccacccc   11400
tttgggaaca ctggccttaa ctgcttacct tcaaatggac tcatctgttg ggagatatat   11460
gcattctgcc gttcagggggc cattgccata agacctgatc tctgttcctc ttgctaaaca   11520
gaagatgaaa aagacaaatt agattacagc taccaattaa taattagcct taggatcgct   11580
gcgtgggggac ctaggacttg gctttggtgc agcagaaagc atgaataaac acaccagcat   11640
acactcgcat gcatgcccca ccctctcgag caaaattcca caggtataaa taaagtaaga   11700
ttctgcacct gggttaaaaa cacaactgca acagcataga atggggcagg agagacagaa   11760
cttaatagca agagcacaca gaaaaaagtt ttaggcattt tggatgtcca tctgctcagg   11820
atgggtcagc agtgagatgc ggtcaccaaa agaacaaatg taacattagg ctgcattaat   11880
agaagcagag tatgtagaag gagggaggtg acagtcctat gctaactctg ccttggccag   11940
actatacccca caggagtctg ggcatgccag tctcagggag acccagacag actggctgca   12000
ttcagaggat ggtaagtaat gagagtgggg attggacttc aaactaccca gacaaagaat   12060
ggctgagcaa gccaaggatg ctgtggctgg ggcagagcag actgtgggct atgtagtggt   12120
ggatacctag cctctgcagg gctgtcatag ggaaaggaca ttgagaagag gactgaggct   12180
tgttcctggt ggtcctggca tgaacggcca gatgatcaca tggtcaggtg gacacagtct   12240
ccaacactgg gagtagccaa acacttactg ccaacctccc gcccttctcc tgactagttg   12300
cagcataggc aattgggagg agcttcctgt ctccatctga aagctggctg ggtgggcagg   12360
gggaggagcg agccaagttt caaggccgca gtttcagcac tcagtctggg atcggctcaa   12420
ggagcaaagg ggaagaacat agccaggagg gaataacatg aaggcccca gacccagaaa   12480
aggcatgact tgctctgaga ccctcagccg gttggtgtca ggttgtgact cggatccagg   12540
tctgactccc agtccagtgc ttgaagcctc accccacaca gtgaggggag cccggccatc   12600
tctgctcaac tgctgccatc tctctcccct tctcaaccac caaggcagct ctgtctggga   12660
gcacaagctc caagtccact ttctggtctg tgtcccccccc aagatgccag aggacttgcc   12720
tctacaacac gggctgcccg tgcagtgcct gcttttccag caaagggctt ctgggaaccc   12780
ttctctgcac tcagtgggc tggtgggagt ggggcggggt agcgacccag tgcttgggac   12840
tgtgcccagc tctcaggcct ggcagcagtt cctggccttg gttcctgcca aggcagagag   12900
dacaaacaca tggcaccggg aagactacac cagaagcgat tccaccagac tggggtttgc   12960
ttttctatcc cgcccttagc ctgcttcctg tcctggtccc tgcctccccc tccactggag   13020
ctgccgtgtg ggcagtgagg ggctgtttct cagctgccct atggagctgc cctctccctg   13080
ccaaagcatt ggcaaggcgg caaggggtgg gggtggggat ggggggtggg atctgccttc   13140
tcaagctctc attatactga gcacgtctca cccattattt tatgtcatct agcaacaccc   13200
catgtggaca ctgaggagca tggggtcac atgaccactg cccaaggcca caccatccgg   13260
atctgcctga gatggtcagg gttggcagcc atttctgaag gcagtccttt cgctttggct   13320
cttcttgtac cagtctcagg acatcagggc agaagatcta cagtccccag cttactgatg   13380
tgacagcaga ggctcagaga ggttaaatga cttgcccaag gtgacacggc taagaagtac   13440
agtatctcct aactgcagac caggtgcttc tgctgcttct ggggacagat tcctgcgtgg   13500
ctggctaggt ctaaacggtc cttaactcca tccccaccgg ttgctgcatt agtttcatca   13560
aataacacag ttgtacagag gtaggggttc aggggcaggg gcagatggag gctggagagt   13620
gtgactaagg aaacagcagg ggaagtgcgg taaagtccga agggagggac ggaaagagaa   13680
```

- 8 -

```
agccaagccc aggggcgtgc cagacaaaag gaaaggccac gccggggcag ggcaggcttc   13740
agcgggtgct ggggcgtctt catcccggga agcacacatt ccagaggacc ccggagtcta   13800
atggaaaagc tggccagcct atcactatgg aaactgccaa ggccacacag cgctacgcgt   13860
atttaaatgt gctggagtgt tgagatactg tagtggtggg atgcttaagt gctggggtgc   13920
tgggtgttgg gatgcctagg tgctgggggtg ccgagatgct ggagtactag tgtgctggga   13980
tgctgaagtg ctggggtcct gagatgctgc agtgctaggg tgctgagatt ctgggctgct   14040
ggagtgttgg ggtgctggga tgctggagtg ctgagatgct tggacaatgg ggtgctggaa   14100
tactatggtg ctggggtgct ggggtattga gatgctaggg tactgggatg ctgaagtgct   14160
gagatcctgg agtgctgggc tgctgggcca caggctcttg aatccattcg tctgcccagg   14220
ggaagaaacc agaagataaa gagctaatga aggagctttg gttgagaggg aggaagtaat   14280
ggaaggagca acatcttgtg gaggagcagg agagaatgga cctcaggttg ggagagaggg   14340
ccaggctaca ggccagagag gcagaaggat tccagcagag tgtgggctcc aggagccaag   14400
gggaaacagg tttctgggag gagagagtcc agtactgctg aagtggcaag tccgctgagg   14460
accaggaagc ttcatttggc tttatgacca ggaggaattt ggaactgtga ctagagtact   14520
taggggggaag gaggcaagac tggagccaga ttgctctggg ttgaggggtg agtgggaggt   14580
gaagcagggc actgtcactc ctttgaaggg tggcagagag ctggaattgg tgctggatgg   14640
gctgtggggt gacagggtca tgtggaaagc ccctgggggg cacctggaaa aggagaagct   14700
gacagtacag tgagaggaca gctaagggaa agcggaatgg cagaacacgc actgccagga   14760
ggaatgagga tagggtcagg agtgccaggg gcagtgaggc cagcctgggg tcaggtggca   14820
ggacgtgtcc aggaagctgg tctgcactgc agcccacact ggctcagcct tgaggttccc   14880
tgtgtggttg gggtaggaag ttgaaccctc tgggaatgga agatggaacc agctctgcga   14940
gccaagctca gcttttatct atgggtctct gagggctggc agagctgagt ggggacaact   15000
gtgatccgtg aggctctcag gttgaggtgg cccctccggg agggcttcat tttcccagcg   15060
ggtaggttct aagcagcagt ggctgggcag gtgggtccaa cacagagcca gagaagggtg   15120
aatgggcctc ctggcacccc accctgctg ccctgagct cagtgatgga ggggacagc   15180
acagctgagc ccaagtgctt tggtgtggcc ctgagggaaa gctgcagcct gcctggggcc   15240
tggcatggat gggacacttg aggcagaggg acaatagtgg gcgctgcagt gaggctggct   15300
cttggagagg tttcctgagg agtgctgcct gagacgggca gggagaacag agacaaagtt   15360
ggtgacaggg aatgaaagct gactgaagga ctttacccag acctatgagg atatctctct   15420
cagcaggaag caggaggga ctgtgtgagg actggccaag agctggagtg ttgggaaaat   15480
gactctttct ccgacccctc tgtcctagct ctggccctg gactgcggag gtctgcttcc   15540
accccattg gtcgatcgtt gtcccttgtc acagccattg agaattttgg cagggagcat   15600
gttcttagag catttttagg ctctgcggga cataacagct ctgcctcaga gcacatgcct   15660
ttctcagctc ctgaaagcca ctgatcaaat tggaacattt tgtaccttag ggatgaggat   15720
atcaactctc ccagccactt agagggataa atgtgatgat gcattcaatt gtgactacat   15780
ctgatcccaa ctgttgcttc agctgctctc ctatagcaca tggcgggagg cgtgcatccc   15840
agtagctacc tccccacttt tggggagatg tggttccatc catgaaacct gggtacccgc   15900
ctaccaggtc ctggcctatc aggtggcagg gtctggtcaa agaagggcat gtgtggtctt   15960
cagcaaggga gacaggacgg tggtgcagag cgtctagacc ctcagggcaa gtctcccca   16020
cacctgctcc cggggcagtt gtctttgtga cctcccatcc ccctctgttt catcctctat   16080
aaaatgaggg gctgagcccc aaaataacag gcttctttgc catgatgcaa aactgctgaa   16140
tctttctttc tgacacacaa ggcatcgagc agcctctgaa agaaccaaag ccactagcag   16200
gcttcctgac ttgggtttgt aggtactgaa tactcccttg aaaaataaaa acatagaggc   16260
acttttctcc tggctgttta ttacagaacg aagaaaaaac acactggctt gaaacagacg   16320
ccagatttca aatgtagagg tgaaatacga ggtggcaatt aaaatgtgat tacagaaagt   16380
ctggacactg agaaaagttt acaggacagt gggtgtgggt tttctataac agacacttaa   16440
atatacatga cgataattgc agatagaaac catcaaagac aaaccccaaa tcaactaata   16500
atgtttacag atgttcccc ccaaaccaca gagccttaca tcaaaacaaa tactgaaagg   16560
ctttaaacca ggaacagctc gccttaaccc cacgagggtg cacacaagct gggcttttc   16620
tctcggtctg aatggtaaag ggaggaggat actctagctc ctccaggtgg attgctgaga   16680
cagggctcgg ctcacacact gtctctgcgc ctctcccaaa tctggagaac tctcccagcc   16740
tcctggtaaa gtgtctctgt ggggcactta acgataaaac agcttctgct gtaaagctca   16800
ttaggaaaga gctagcggag actgaaaggt cgcaaaaga gattaagaat cacacaaggc   16860
aataggattt ttagtgaaca tagaaataaa tggccaagtg gttttctatt tggcatttgt   16920
caacttgcac aacaactctt ggtcatatcc acattgctca ttgcattaaa accataagcg   16980
```

-9-

```
actcagccac  ctagcttaac  aaggtatcac  tggagcaaac  aacacggtct  gcatatttgt   17040
aacattgtat  aataaacaca  aaacaatgca  tagtaaacac  aactctactg  aaacaaaagc   17100
cgtcgcttta  tttacaaagt  cacaaaatga  agtataaata  cttctgtcat  taatgtttag   17160
gaaaaccatt  tacaaaattt  tcaaatatgt  acacgtagct  tgaaaaatca  ccagctttcc   17220
attttgtcac  aggtagagag  agggataagc  atgggctgac  aacaccactc  aaattgtaac   17280
gggagacaac  tgcgggtatg  gatcgacacc  acttcctaga  gtgatgtcac  catggggtt    17340
tctatgggca  tcctgctcag  atttaaagtg  ccccagcatc  ctgggtgact  tgcccagaat   17400
tctgggctgt  ggcattttga  gcagcagcat  gctgttccaa  aatgtcgtcg  atcagcctca   17460
agttgcacac  ccagtcttca  tctgggctca  cacaggagcc  tttcaagaga  gcttcaatga   17520
aatctacctc  attgcagtca  ggtgacgaaa  tcagatcatt  tagtgggggt  tggggctggc   17580
gcaaaaagtc  ggcaggtggc  agctcagggg  gaatatccgt  tctgtcgaac  ggacctggga   17640
actggctggc  agcaacggca  gaagcagcag  cagcggtggc  agcagcagcc  acatagcttg   17700
gtggctcgat  gccctgtatg  gggctcaggg  gactaaagct  ggccataccc  tgctggagga   17760
acttggtggt  gtttgctaca  ggcaccgggc  cctgtaccgg  gctctgcctg  aggctctggc   17820
tgcccagcag  gctgaagctg  gggttgttgg  ccaggggcac  ttgtgttccc  atcgcagcgg   17880
gcacttgtgc  ctcccaatca  gatggcctct  gaaggcaggc  ctggccagaa  ggtgagtgct   17940
gctgaacgct  attatccact  tggctgaggg  gtgttttccc  cgaaactgct  gtggtcacag   18000
ctgctgccgc  tgtgacccat  gcagcattgt  tgaacgcagt  gggcattctt  ggcacactag   18060
gccgtctgag  ctggtgggga  ctcaaggact  gggtgcccag  ggagctggga  cagaacccag   18120
gcaggggcac  ttctggtggg  gtggccttgg  ggctctgcat  atgctggcag  acagagtcaa   18180
gtctgcccag  gggagtctgg  cctgagtgtg  agaggatggg  acactggggg  ctggaggtga   18240
aaattccttg  ccgcttcccc  agagttggtg  agatcactcc  catgcccggc  gcgcgcgtcg   18300
acacgacagg  gacatactgg  gaatgcgccc  ttgccgtgga  ggcggggacc  cggcagcgct   18360
acgtatccag  catcaacctg  tatccagcat  caacccgcca  agttcactaa  cttggtaggg   18420
gtgaggttag  ggatccttag  gagcccaggc  agccagactt  tctggggagc  ccattcccat   18480
ttgtgttgcc  aaagtacccc  cagcaggttg  tgggaatgtt  gcctgtgaag  agagtctgtt   18540
ggggtgagat  cttgtgtgtg  tgcacagggt  gacagttgtg  tcccatttcc  cgggaagctg   18600
tgatggcagc  agaacctaga  ggagcctgag  agagtgtggg  agagtgggcc  tctggaagag   18660
tagaggctgc  ggagccaggt  gcagggctgt  ctgtcaccca  aaggaagagg  gactgatgac   18720
tcactgagcg  tgtgtgtccc  ctggtggcag  caggccccat  agtgaacata  ccataccttt   18780
tctgtcctga  gcgatgctcc  cagcagtcct  gggagatgga  acggtcctta  ttcggctcac   18840
aggaaggacc  gccttaactg  gacagacaca  gcaaggtgct  aaagatgcct  tccatcagag   18900
gccaggttgg  aagctctaaa  gagacttctc  ttgctgttct  ctcacccacc  cccaggttgt   18960
gtgtgtcccg  ctgtggattc  tcatgtcctt  tctgtgcctg  gtggtcctct  actacattgt   19020
gtggtccgtc  ttgttcttgc  gctctatgga  tgtgattgcg  gacagcgcag  gacacacata   19080
accatggccc  tgagctggat  gaccatcgtc  gtgccccttc  ttacatttga  ggtaagcgtt   19140
ccacgggaag  cctcttcagc  ccctgaagct  tgcgcttccc  ctgacaggat  tctgcacccc   19200
tagaaaggca  gcctctgtcc  ctcgagctca  cagtgagccc  actccaggag  aggggagaga   19260
acacagccat  ctccgagagg  gagcttcggt  gaaaggagag  catccttcct  ttctcttggg   19320
ggcagcacgt  ggggctggca  gggagaagag  tgcacctttt  tagccatggt  gcctctgtat   19380
ggctccagtt  tccactctgg  ggaaagcaga  gtgggatgtc  agatttgtgt  attggagtca   19440
cgtggagaat  tctagaatgg  gagctgttga  ctccttagaa  caaacacccg  gaggagtttg   19500
ccataaaact  gctggcactg  ggaactttc  aagtggatag  gctattgccg  agctctgaag   19560
agggacataa  aagctcattt  cgagctttcc  ccaggatag  gtggtttcct  gccttttct    19620
ggcggtgctg  atgttccctc  ttgtgggagc  tcacgcgggg  gtggggtggt  ggggaggaac   19680
tgcctaatga  agtctggctt  ccgcctctgc  ccattttcgg  tgctggcatc  aaccgggact   19740
atgtctcttt  ctttagattc  tgctggttca  caaactggat  ggccacaacg  ccttctcctg   19800
catcccgatc  tttgtccccc  tttggctctc  gttgatcacg  ctgatggcaa  ccacatttgg   19860
acagaaggga  ggaaaccact  gtatgtactc  agcatttcag  aagtccttgg  tgtgtgtctg   19920
ggggggggacc  aggggggtggg  gggtggcgga  tagaagtcta  ggaagggatg  agtccccgag   19980
ggccccaatt  tagaagcttg  tgtgggaaag  tgagggctga  ggaaattctg  ggaccttcta   20040
agggaagggc  atgccgtaac  tctggtgttc  tgctggcctg  caccgggact  tttctcgcag   20100
tgcacgctgc  catttgaggt  agaaccagac  acggcaggca  acctctcaga  gatcccgttc   20160
cctcctctgc  aaaatgggga  tcaagacaga  ttcttcccag  gcccgggagg  gtttgatgga   20220
aaatccacat  ctcccaccca  aacctgggat  tcatcctagg  tccctgttgg  ccgctctgcc   20280
```

- 10 -

```
tcccccatat  ccttgctgcc  atcacccgag  tcttgcctgt  cttgccttgc  taacactcta  20340
ttcccctcca  cctgcttgct  gaggcagaca  cttccaaaac  gatctctgca  gagggtgcct  20400
tcctggcaag  gctgtgggct  ccatggcacg  gaagcccaga  gcattgccct  tcggaaagcc  20460
agtgggtttg  ggggcagggc  ctcactgcag  cccagcagcc  cgggctgtgc  ttgctgtttg  20520
tgcctctgcc  ccctacccctg  cacccgggag  cagggagggc  ttgcaccgag  ctgacactcc  20580
agtagcctac  agagaggagt  agtgggactg  ggaaagtggc  tttaaggtgg  ctccatgagt  20640
tcaggccccc  tcctggccaa  cccgtgcatg  actaccgccc  tcacggattc  cagagggtga  20700
cagaaatctt  gttcttgggt  ggcactgtca  tccatgagtt  tatcctggct  ggagaagatt  20760
agcggaagac  accgtagtct  gcgcaccaca  gatattttga  gactcactgg  agcagtagtt  20820
ctcaaatttg  ggcatccagc  agaatcccaa  aagggccagg  aaaaggggac  cgctggagcc  20880
caccctagcc  cgactcagtt  tctggaggtc  tgggctgggg  cccgagaatg  gcatccctaa  20940
ctaggccccg  tggacgctgt  ccctgccggt  ccgggaaccc  cactccaagc  accacagagc  21000
tagcatttgc  acttcttccc  cattttgggt  actcaagccc  tgttcaggct  ttgtgactca  21060
ggagtctgga  taaagtatgt  tatgacattg  taggagtgaa  acttcttgtt  acggaaagaa  21120
agttaacagg  aaggtcagtt  gagcctcgtg  tgtgaaataa  aaaattctta  tttttcaggg  21180
tggtttggta  tccgcaaaga  tttctgtcag  tttctgcttg  aaatcttccc  atttctacga  21240
gaatatggaa  acatttccta  tgatctccat  cacgaagata  atgaagaaac  cgaagagacc  21300
ccagttccgg  agccccctaa  aatcgcaccc  atgtttcgaa  agaaggccag  ggtggtcatt  21360
acccagagcc  ctgggaagta  tgtgctccca  cctcccaaat  taaatatcga  aatgccagat  21420
tagatgccac  ttccggggac  agagcttaag  tggactggga  cgcactctct  ccgccttcct  21480
ctgccccctc  gttcacccg  cagaccagaa  ccagtactgg  agctgggtct  ccaggtacgt  21540
ccatctcatg  ccttgtttgc  atccagcgcc  tatcagccac  tcaccacgac  gggacgcgga  21600
agtggcaggt  gacgggggtg  tgtgccagca  gatgcggatg  ccaggaagag  tgtgagaaca  21660
ggggtgggat  taccgtctgt  ctgggagggg  ctccaggtac  ccctcttccc  cgtcagaccc  21720
actgggagat  ggctgcttgc  caggccccca  gaaggaacat  ctgtctatac  ggtgctgaaa  21780
tcccaatcaa  aagtattgtt  tagaaatgta  tttctccaca  gggctgacct  cctgcagctc  21840
gctgagcact  cccaggtcct  cagcactccc  aggtcgtggc  tggggcagtc  agtaggaact  21900
gtaactatgt  ctctgatgca  ccacgtgttt  agacacagca  cagtcctttt  ttctgttcct  21960
actgtggaag  tagtttctct  ttgggcatgc  tgacagcagt  ttttcatagc  ctcacggatg  22020
agccctttct  acgggagtga  ctccatgctt  gtatacagag  tatttataca  aatgttttag  22080
catcttcata  tgcggtgtta  acccctagtt  ctgtacagca  tattctgttc  aagtattttt  22140
ttacaagctt  gtgctgtagg  cacatgcctt  ctgctgcaga  agtggacgcc  cgtggcacac  22200
tccccccccc  ccccgtgggg  gtgccacgcc  ttcatgggac  attgccactt  ctgccctgga  22260
actcgtgcag  gtacgtagta  gctgctactg  ccacaacggc  aacaccaagc  aagagatggt  22320
ccatgctttt  ctgacgttct  cagaatagtg  gctagcttca  aacctgacaa  gcgctgcttg  22380
aagccggaac  actagagaat  gttgctgaga  gcagaaacgg  ccacgcgggt  cacgactatg  22440
cgtgggaaag  tctcaagctt  ccctcctgcc  agcaacaaga  aggctttgga  gtaggcatga  22500
tgttttcacg  tgtgcgtgcc  gtttctccaa  gcactgcagg  ttccaccgtg  tgtcagaggc  22560
tgcaagttta  acatcctcct  gcctgaaaac  aaataggtcc  tttgctgaaa  agagggtaaa  22620
aaaagagctt  tgatcttctc  agccaggaga  agagggtggt  gttttcacgc  gggcaactgc  22680
tcgccggcct  acatggggtt  aattcaagtc  tgctgcgagc  acgactccgc  ccttggcact  22740
ggcctccagc  aagccctgtt  ctctttgggg  tacaggggaa  cgggatggtt  tagactttcc  22800
tgctcagtgt  gtaaaaaatg  tagctaaagc  cactattttt  gctctcctta  agctgttcaa  22860
taaaccggtt  cctcatttta  cacgtgcatg  atgtgtatct  tctttgctgg  atgggccagg  22920
aaactggagt  ggtcctctca  gccagcctca  gaggaaagaa  atctctagct  ggcacaggca  22980
gccagtgagt  gaggctggcg  gctgcagggg  cacagccttt  agaatgagtc  cttcagtgca  23040
caggtcccag  ggtatacggg  gtagtgggag  gaaggagggg  acgcctcgca  gatgccactg  23100
ttggctgggc  tacaccttgc  cacacttgtt  actgcttagg  aggctttctg  gagtgttcct  23160
tgggtgctac  gacaatctgc  agcagacact  gtcctttcac  cgctcctggt  cctcgtttgc  23220
tccccagtga  tgtcaacagc  tgaggactgc  tcacgctgca  acaaaaggct  ctgcagtcgc  23280
tgtctagctt  gccctagtcg  tctctagagt  tctgcctgaa  ctgaaactca  agtggggttc  23340
agctcatgac  ttgtggcaat  tgaccaggaa  attcaccagt  tgctgtggct  ggaaggattt  23400
tcagtcctgt  gggttgtaac  cagaggccac  aggtggattc  tgccttaggc  tcatgagatt  23460
tccgacttgc  tgttgaagaa  aatgccttgt  gaagtgacaa  cagtagctct  gacccaactg  23520
ccggtgcctc  gctagttcct  atacgtccca  ctggatcctc  acagccccgg  gaagcaggtg  23580
```

- 11 -

```
ctactactct  tatccccggg  aggagacaga  ggccgagaga  ggttaagtga  cgtgcccaag  23640
tcacacagct  cggcagcggc  cgggttgagc  atcagcagtc  tgtttgcaga  cccctcactg  23700
tcaccccctg  agccagtgcg  ccttgggccc  tgcggtcagg  atgtctcaag  cgtggaggca  23760
tcaccggttc  gtggcagtct  ctggaaggtc  actgagctct  gtgcccagaa  tcgagtcggg  23820
ggagtctgtg  cagaggtggc  cctgtgtgtg  gggacagtgt  gtgacacaga  cactgctttg  23880
gatggacacc  tctcccgtga  cctcctagca  tccaatccca  aaggaacaac  tgttgcagag  23940
atggaccgct  ggacacaaac  ccacgtgcgt  ttctctggag  acactggcca  aggaaaacaa  24000
aacatgctcg  aaggccaaca  gctgcatgcc  ccaccgcgat  gtgaccgcag  acacccgggg  24060
tgtagaaggg  tctctgcctg  gtggggggac  acgtgcaggc  cgaggagagg  caggaaggag  24120
gctgcctccg  actccccact  ggactgcatg  gcgacggcgt  gtggtggggc  agtcagctaa  24180
gccatttgcc  taaggggctg  tcgggcatct  gcgtgctggg  gaccgacagt  gtgggtgtgt  24240
taggaggatc  tgtatggagc  acattgctgc  ctctggctag  gacagggtgg  aaagggtggc  24300
gtggctacag  cctgacccat  gggcaccgtc  ctaccctttg  ttctgtgctt  ccgagtgtca  24360
gtcatgtgct  ggggtctgtg  ggcccatgac  tcagacggtg  agctctgacc  ttcctgagcc  24420
agggctttgc  tgtagttgtg  cctggctcag  gagctctagg  acaaggggac  cgctccaggt  24480
ctgcatctac  ggtgtggcag  ggcccctcgg  cactcttgtg  cactagtgtc  atctttccca  24540
ttgaaatgac  tgtgaggacc  agaatgtgca  catgcagatg  ggcagctact  tgtctgcctt  24600
ggccctttat  tacacaactt  gctgggggtg  gagatgccac  ccccggcag  tcagagcccc  24660
tttatgatgt  catgggggctg  gttacatgac  tgccaagggg  tgctgctggc  cacactgcac  24720
tagcaagttt  gccagatgga  ggacaagcga  tcattgagta  tggctcgctg  tgaagaaaga  24780
aattcgagag  acaggatca  tggcttggaa  agggtgcctt  tccctcccca  gttgcagtca  24840
gagacctacc  ttcacccagc  agatccttcc  cctgcctggg  acgacccggg  gtccactggg  24900
agccctaact  tgaggctgct  gacagaagaa  atcgctttcc  aacctctggc  cgaggaagct  24960
tcgttcagaa  ggccgcaccc  tgacggtgac  gtcccgcccc  agggagaaga  taatctcctc  25020
tccctcccct  ttccacagaa  actgtggaga  ctggtcagca  gcaaccagtt  ttcgtccatc  25080
tggtgggatg  acagtggggc  ttgtagagtg  atcaatcaaa  aactctttga  aaaggagatt  25140
ctcaaaaggg  acgtcgcaca  caaagtgttt  gccacaactt  cgataaagag  cttcttccgc  25200
cagctaaact  tgtatggctt  ccgaaaacgg  cgtcaatgca  ctttcaggac  cttcacccgc  25260
attttctccg  caaaaaggct  ggtctccatc  ttgaataagg  taatgaacga  caagcctctg  25320
gaggggttaa  gtcggtgggc  tctggggcct  ggtcgggtgg  aagtcccagg  actgcctcct  25380
gggaagtggg  cgacctcagg  cagggtgtgg  ggccatcgct  gtgggcctgt  gtccccctct  25440
gggtggaggt  gacatgaact  aagagtgaat  gtggggagag  ggctgaggat  ggtgcgggcc  25500
cctctcgagt  gtgtaaaata  tcacaggtgc  caagtagccg  tatctgcgtg  tcgtcctccc  25560
cggggccagc  catgtcatct  ggtggttgct  gtgtcccct  gactccacag  cacattaccc  25620
tgtgaggtga  gcaggccagg  gggagtctggt  atttgtacca  ctgtcaccct  agctggtgtc  25680
tggagaggtg  ctcaagtgga  agcactgaag  ggcgcctggc  gcaggaggtg  cagatgctcc  25740
tgctgccctt  ggtaggtggg  cccctggtgt  ggaagagcca  gtaccaggg  cctccaaccc  25800
agccggggtg  cattctgttg  ccagctgaca  ctgcatgggg  gaggcccaga  atcttcttcc  25860
ctcctggtct  gcaacttcaa  agacccttc  cgccggccat  ggacaccta  atctgccatt  25920
ttgaggcttt  ttccaagacg  gaaaggcccg  ccacaacttg  gtaaaccttg  acgatgtgaa  25980
cgcgagtccc  cagcttcctt  tggggactgg  gaccttttcc  agaaaggcct  cctgggccag  26040
tagagttctc  ttgcacaggg  gcgtagatgg  ttggtagttg  tagtccatcc  ttgtgacttg  26100
cagtttcctt  ttgtttattt  aaactttgac  ttatagttag  agttctactg  ccatccttac  26160
tttcaaagag  actccctca  cctcctcgtg  aggatgaaga  gaagagtggg  tgtcaagtct  26220
gcaccaagac  atcaggagga  ggacaagcca  gaagctgctg  gatcctgtct  ggcaccagca  26280
gacactgagc  aacaagatca  cacgtctccg  aatgagaatg  accaggtcac  accgcaacac  26340
cgggaaccgg  ccggtcccaa  cacccaaatc  aggagtggct  ctgctccacc  agcaactcct  26400
gtgatggtgc  ctgattccgc  cgtggcgagt  gacaacagtc  cagtgaccca  gccggccggc  26460
gagtggtcag  agggcagcca  ggctcacgtc  actccggtgg  ccgctgtccc  tgggcctgca  26520
gcgctgccct  tcctctatgt  ccctggatct  cccactcaga  tgaattctta  cgggcctgtg  26580
gtggcccttc  ccacagcgtc  ccgtagtacc  cttgccatgg  acaccacagg  acttcctgca  26640
cctggcatgc  tgcccttttg  ccatctctgg  gtaccggtga  ccctagtggc  tgctggggct  26700
gcacagcctg  ctgcctccat  ggtcatgttc  ccccatctcc  cagctctgca  ccaccattgc  26760
ccccacagcc  accgcacgtc  acagtacatg  ccagctagcg  atgggcccca  ggcgtaccca  26820
gactacgcag  accagagcac  atagagggca  gcatttgggc  agaatatgtg  ctggtcaata  26880
```

- 12 -

```
aatgtgtcag aaaatgagta attttctgac tgcacaaaaa agtcttcatg gtctccatcc    26940
tttttctttc tttgcagtcc agtacccccc tccgacatct ttggcttgca tgatagagac    27000
ttcagcctaa cacgcctccc tggaaaagtg cccaggagat actcgagcag gtgctgggtt    27060
ttaggaagcc cctcagacat cccgcctcta ctcattaaaa attacctgga gctggccggg    27120
cgcagtggct catgcctgta atcccagcac tttgggaggc cgaggcgggt ggatcacgag    27180
ctcgggagat cgagactgtc ctggctaaca cggtgaaacc ccgtctgtac taaaaataca    27240
aaaaattagc cgggcgtggt ggcgggcacc tgtagtccca gctactcggg aggctgaggc    27300
aggagaatgg catgaacccg ggaggcggac gtgcagcaag ccgagatcgc gccactgcac    27360
tccagcctgg gcgacagagc aggactccgt ctaaaaaaaa aaaaaaaaa aaaaaattac    27420
ctggagttgc tcgctgagtg ctaattgtgc tgctagcatt gccggcctag ggttcacaat    27480
gactctgtgt tactggccat tccttgtcat ggcggtgcct ttatataaca ggatcttcac    27540
tttacataca gatgagatca cgtctggctt tgtcattggg ttaaaaagtg cccttgatag    27600
ttgtggaggt gacacatact accgtcgact cgaatagatc tgctaggcgc caagcttgtc    27660
agccttacca gtaaaaaaga aaacctatta aaaaaacacc actcgacacg gcaccagctc    27720
aatcagtcac agtgtaaaaa agggccaagt gcagagcgag tatatatagg actaaaaaat    27780
gacgtaacgg ttaaagtcca caaaaaacac ccagaaaacc gcacgcgaac ctacgcccag    27840
aaacgaaagc caaaaaaccc acaacttcct caaatcgtca cttccgtttt cccacgttac    27900
gtaacttccc attttaagaa aactacaatt cccaacacat acaagttact ccgccctaaa    27960
acctacgtca cccgccccgt tcccacgccc cgcgccacgt cacaaactcc accccctcat    28020
tatcatattg gcttcaatcc aaaataaggt atattattga tgatgttt              28068
```

```
<210> 17
<211> 30115
<212> DNA
<213> Artificial Sequence

<220>
<223> Modified adenovirus

<400> 17
aaacatcatc aataatatac cttattttgg attgaagcca atatgataat gagggggtgg      60
agtttgtgac gtggcgcggg gcgtgggaac ggggcgggtg acgtagtagt gtggcggaag     120
tgtgatgttg caagtgtggc ggaacacatg taagcgacgg atgtggcaaa agtgacgttt     180
ttggtgtgcg ccggtgtaca caggaagtga caattttcgc gcggttttag gcggatgttg     240
tagtaaattt gggcgtaacc gagtaagatt tggccatttt cgcgggaaaa ctgaataaga     300
ggaagtgaaa tctgaataat tttgtgttac tcatagcgcg taatatttgt ctagggccgc     360
ggggactttg accgtttacg tggagactcg cccaggtgtt tttctcaggt gttttccgcg     420
ttccgggtca aagttggcgt tttgattcgg ccgcttgggt catagacttc tttgagaacc     480
agttataagc tatggtttct ctccacagaa aaagcactta ggtgtctcc ccctttccag     540
cccaccaaca ttttacatct aatttggggg ggttttctgg accacttaat acccatccat     600
ggatctcatg tgaagactcc cctggcttga gaaatcactg tcttgttgaa aatgggaaca     660
aagctaagtc agatagctgg ttcatcagca atgactttga ccaagcctga tcccacccta     720
ccccaccccca ccccagtgac cacccccac aatggagcac acaactctaa actggtttgt     780
aggtatgtgt gtgtgaacac gctgaggaat ctgcaaaacc aaatggtgag tgcaaaacca     840
aacagtcacg agtaaatctc acaacaacca cgtcctgagc tgcagccctt gttgaactat     900
accccactag ggccccaaga ttttaggact tgtgtgtggg tgggacctcc cctttctatc     960
atgctttaga agacagggat ttcaccagaa ttgaacatat tgaacatatg acccatttt     1020
ttcagccaaa ggcaattaaa ataacttcat acttgatatc catgtcagca aaagctgcaa     1080
aacgcaaatg ggtggctgct aagagccctg gtaccctgac gagcacacca agtgcttagc     1140
aacagtggtg tccaaggac cagctggaag cctgccttga tgagaagttg ctcttctttc     1200
tacatgaagg aacacctcta ctctcctgct tttaataccT gagctgtgag tgatcatcta     1260
tgtccattag caaacatccc agtggagaag gaaacactca tacccgaaat ctaagctaca     1320
tagttggaat cacttcaact tattgcaata aacacttact aagcacctat tgtgggcaag     1380
```

- 13 -

```
tctttgcaat ggataatagt tcagtagata tttttgatgta atatttgaaa taacaataaa  1440
aattgccacc actgaattta ttgagcattt gctgtgcttt aggcactaac ccaggttctt  1500
taaatatttg gtcttattcg atctgtataa atagccatct atgagaaagg gactattatt  1560
gcccttattt tacaaatgag gccaatgagg cccagagagg ttaactaagt tgcccaaaat  1620
catacagccc actagtggca gagcaggatg caaacccagg cttgcctcgt tcccaagccc  1680
acatgtcgtt tgcattggtg tggaggtgtg catgtgttta gtcattagca tgttatatga  1740
taagcaagtt ttgaaacata gaaacttaaa atgtgccatt aagaaaagta caggcaaggt  1800
tttccaaggg gaggtgtgga cctccggaca aattttttaag aactaattat aaatacttaa  1860
aaatgggaat aagaagacaa cctaactacc tgaacagttt tagagatgac tcatgcccac  1920
cctctaaaac ccaaacaaaa acaacaaagt caagaaaacc catgaaatct tagcaagcga  1980
tttctatgta cttgtgaaaa ggatttcttt accattctaa tgggatttat gccaaccata  2040
gagggctcag tgcccctccc atggggtggt tagtgagtac agagctgagc tcaccggcca  2100
tctgcagctt catgttatca agctccagtt tgtccttgga gcaaggttat ctgggacatg  2160
agcagaggca ttgctttctg caatggacag ttctttctgc ctgcatacct agctccttga  2220
taactttaaa taccatttta tagccacact ggagttttga agacctcaat atgcaaatat  2280
tactcaggtt ctgattactt gtctgctcca tgataacaca ctctaaaagc aatgaatggg  2340
gcttatttgt agagaactga agcattttaa gcttttgctc aggaatccct ggtagcttcc  2400
tgtgacttgc aagatattag tgatgggtca agaaacagga ccccccatca gcataacata  2460
cgcagtgcct cagtagtcca tcaggcagaa aaaactgcag atggcacatg gaaatgacca  2520
gcggcggaag ataccccgac agtgtgggca gttctatttc agcagcaatc aagagggggc  2580
ctggagccac tcaatcaagt ggagcaggat gggagcaagc actgtgcaga ccaatgcaat  2640
ccccagttaa cacaaaaaat aaataaaaga gatgagattc agtctcttga ctgtgactga  2700
ctgggagctt tatagctgat gcttgtgtct tttctccatt ttatttaatt aggaaaagaa  2760
atgcttatca cacactctac gtgtgaggta caacctccac aggaaaggtt gttaggaaca  2820
tttcaacttc tagaagtttc taaacataag gtaaatccat ctttgtcctt gggatcactg  2880
cacatctcag aaaggcaaat aaatcagtaa ttggtgggca taattactag ctcatggact  2940
gacaaggtct acactatttc gaatctcaca gaagtaagcc atgggacaga tagagtctga  3000
tagtggtgcc ccgtttcctg gaggtcacac ttactcatcc ccctggaccc tgggcttctc  3060
atgattgtca gagagtttgc tggaaccagg tcagcccagt ttcccttccc ctgaaaaatc  3120
ctccaatggc tcgcaccaag actagagatg caagtgcaag cacatccacc ctctcagcag  3180
ccaggttttg cgttccataa tgtcacgtac ccccagtcat accaatctcc ttggagctct  3240
ccagacaggc tgccatgtgt ggtcggccct ctgtgcttgt gctccttggt ttgccaagcc  3300
tggaatgccc tttctccatg attgtactct gggaattctg tgtgtctttc gagatgaagc  3360
tcctccaccc tggaaattct gcctctcttt ccaggtccag ctcctgtggc tgaataccct  3420
tggctgactg aacattcttg ctgggccaag tcttaatcat ctctaaatcc ctctggtgcc  3480
ccgacagtat ctagcccagg caaagggctc agcaaatact tgcaaaattc aataaacttt  3540
actatgttac tagcttggca tgatgttcta ggcacttggg agattataat ctggtgagca  3600
ttgtgctagt ctttttttttg ggataaacac caatgataaa ctgagccttt actctcattt  3660
tagcacatct actcatctct tttcaatgct ggtgggttta taaaacccat cagtagaaca  3720
gagagtgatc ataatcatat ggtgaaaata acatcagcta acatatttac tgaacatgct  3780
ttagtgtgct gggcactgaa ctctgtgcac atgtgaattt gagatagatt gttcctagct  3840
aataagatga ggaagtggag atgggcttac tcaagtcaca caatagcaag atggggtaca  3900
gacagaaacc aagctagaaa ccaagcaacc cctgggtttg gaaatgcatg ggctcctcct  3960
ctgcacatgg cgaggagcag tcaggtgctc ctccttctct catactgaaa taactctgca  4020
cttttggcta ttctgtgaca ctctgtgcta ttctgtagct caaatggctc tggtgcaagg  4080
agctcagatt atgactaacc cccatagata ttcagctgct ttgcaagaag tggatgaatg  4140
ctctggcttt ataaattat gactagattg gatattggcc caatctccac tctggtgatt  4200
cggaaggagg catatgcaca tttgcaaggt tatagtagtg cactctaatt ccactggctt  4260
ctgagagctt gtaggtttct tgacttaatc attctggaat taaggtaatg gatcctcaac  4320
accttttctt tccctggcct ttactaacca tgtaacagaa atgagcagag aaaacccaag  4380
aaagcgaact ggagacttga tgagtgtgtc aaagatgctc agagtccaag gtcctctgtg  4440
gctcactgac ttcagaagcc aacctccgtt gttcaagtca cttgtgaggt tactatgcta  4500
gagcactaaa tattatccag atagcccaaa gaggtgaagg cagacatgtg gaagaacctg  4560
gattttttggg caagttgatg aatgcctcct gccccatatc aaagagaggt gataggagac  4620
aactttgtga atttgaaata atgcaccggg gaaacaggaa aacgtaatgt aagtcacgct  4680
```

- 14 -

```
tcttggcttt tttcttgcca ttaccctact tggccaagtg caaatgggat ttcaatatat    4740
cataagtatg catctattaa taacaatgca agaaagctgt acaactgaag tctgagattt    4800
tgtaagaaac agaatctctg taagcatcac catccaacag aacttcctga gttgatgctg    4860
aatcatccca gaaagaaggc gcgccagctc tgcaggatct tcaagtctgg ggtgccacca    4920
gcaagcgacg gtcctccatg ggctcttcac cttacggcag tgtccagagg caccgccagt    4980
cctctgctcc tatgctggtc ctgctgtccc tggcaaaagg agccagagca ttctctccag    5040
gcctcccgag gaggctgctt cctttgtttt gcagatggag gctcccatcc tttgttctga    5100
atcaatgtgc tccaaagata agccccaaga aaacagttgt tgccttttga cactgacaat    5160
tagaatcgtt ggaaaatgga gaaaacagga aatggcaaat ggtttcagtg accaggagga    5220
aaccgtgcct gaaagttgct gcttagtgac tgggacactc gctttctgct ctcttatgaa    5280
ggacagccta ggccgtgtgg cctttataa acaaagctat gaaggggtcg tcaaattttc    5340
tagggctgca actgtggcac tacgtcctgt tgtgccaggt gacactgaca agcagcactg    5400
agttctatgc aagcccaggt gtgcttctct catggtgacc cccagagaac taaggcccag    5460
ctcttcctct gtcacacccc tcccagcccc cactgtcaga caagggacca cattcacaga    5520
cagtctcagc caagatggca accttggaag tcctgggat gcctttctag aagctttagg    5580
ctgacgccag ggagctgtaa agcccccacc tgtccctggg ggttgtgtgc tgggcaggag    5640
agaggggaaa gagcccaaac tccaccactg cctgctggca caactgagcc cacgccaggc    5700
actgcaccag cttcactcac cagctaccac atgctaatgt ctcctgttta cccaggtgca    5760
atcacctgag tgctgctttc tcaccactgc atgggaagaa cgatctcatt accaattcaa    5820
ccacttaagc aggcaaaagg actccaacgg gggaaaggca gaggacaaac gattcgggga    5880
ctgagacaga tgcccacaaa atgttcctgg atttttagccg gattcgggct gaagttcctt    5940
gccctatgag cccttggagg agagcatcct gactcagaca agaattcaaa tgacaagact    6000
tctggggggat ggcagtgaat ggatccaaag ccttgtttta taaagaatgt ggaggaaggg    6060
aggaaggaag ggagggaagg ggagactgag agggagagag aataaagaag aggaagagaa    6120
ggaagaggag gaggaggaag gggaggggag aggaaaaagg ggagggtaga ggaggaggga    6180
gaaggggaag ggaggacaga agaggggagg gagcggggag attatctacc cctccatgct    6240
agggaactcc tgtctccttt tccagcagac actgctccat gagtgccccc acagagagcc    6300
agcctgccac acagcagaag gtgctcagct atctgtccca aaggttgagc actagtgtat    6360
accacaagga aaaaaacctt cttttgtact gtttggaagc cagaattaga acaactcgt    6420
tcacccttct gactttccct ttgcaatgac aggaagatag tatactgcat gggaccacca    6480
cacattcaag atctgagttg tggggacccc cacccccaca tgggtggagc cccctgagac    6540
ccgtgggctc tgactggcca tggcccatag atagtgacaa catacacact gctatctgaa    6600
gcctagttgg aggacggatg gatgctttta ggaaaaaatt ccctttagtc gtccctcaga    6660
aactacaacg gcttcctaaa atgaatggca ggcaagtttt gattgtttcc taagttcccc    6720
ctaactctca gagcctgtga ctcagcttct ccagaatgcc tgcagggagg caggaccact    6780
gggagtaatg agcacgaatt gggccacttc tcccagtgga ctgttaacgc cgagatctgg    6840
ggtggaaccc actgaacacc tgccctttg cgttgcccag aatgcagcca gagggatacg    6900
ggccacagta actctggggc ccctgaacct accttcccaa gaccctgacg ggaaggtatt    6960
gcttacatga cagtccagtc agtccctctg tcactcagtt aacaaacatg gtcatgggtc    7020
tactatgggc caggctctgt tccgggcatg gggataacac cgtgtgtctc tactcttatg    7080
gacacaagta aatcaatcaa agcagataat gttctaatga ccacccagta gggtgaaggg    7140
atggagggtg ggcaggtgct ggcagaaacc taaggtcaag tcatgggacc ccaatgggga    7200
actggaaact gccacaccat tttctatgtt aggggtcttt ccttgccctt ctagagacct    7260
cacccatggt aatgatgctg ccctcaggtt tgaactggtc tgaagctgtc actgggggct    7320
tcacaaaatg aatgccactg aaagcaaacg gcagagatct gtatatgaaa ttctttttac    7380
cctttgtttt ctgtcttccc acatgatcta tgactgctgc aaactctatt ctgactcctc    7440
ctcagtcttg gccggtctgg aagaacttg gtttagatgc tgggaatgat cccgggcaaa    7500
ggaaacaaat atatttccag cttgcttttc ttcttcccct gtggtgcctg catcctctgt    7560
ctcgcactga ctcacaggct ggactgacaa agtggctgtg ttgacaggga ggatttagtg    7620
gatgccaggc ctgaccctca aaggccctca ggtggggcca atttccaagg ttcttagaga    7680
agatttgggg ccacaaatct gctctgccac ttcactgctg ggtgaaagct gttggcttga    7740
gaagagagag aataggtgag ggacaataat tctcaaggca agctagctga tatcctttca    7800
tttgtggctt ccaaagacag ggaaaggcaa ggcagaccag ggtggaaaca gcgacatcct    7860
gaggggacga cgtccgtttt gctaattctg tttccctggc agctttgtgc tggacaagat    7920
ttctctggtt tcagctgaag agtgaacagc tgaggagctc tgtgactctg agagagagag    7980
```

- 15 -

```
aaatcaatag cccttgaaag gaaagcactg cttgttcttc caggccaggg caggcaggat    8040
aaagagaaca aggctgtaca taccaaagcc gaatttccat taaaggccag aatcctggga    8100
ggcccttta gcttaatgac catcttctga tcactatcac ttagaaaatg ttcatgtctc    8160
cagttttctc tgcagatagt gcagacatcc tgtgcacatt gatattttat gcaccagatg    8220
caattctctg caaaggtccc ctctggctgg tgtccatccg cttgctctca tgaccactga    8280
tgcgactctg ggggcaagtc aagccattcc ttctagactc tagaatctag aggatgatcc    8340
caactcacag gcctcttgga caagcttgct ttggattcct tctgcctgta ctacccagac    8400
tgccagtcct ccagcagggc aatccaactt cctgcctcta gggtgtggga gtcctgggcg    8460
gggtttggaa tccacagcag atggctggca ggagaggcag ttcccgagca cccactaggt    8520
gccaagcagg caggtatcag gtgcagggct cggaggtgc agaagcacag cccctgtccc    8580
cctcaggttc ccagtctggc ctcagggaca gacaggcagg taggtatgga aacggggtac    8640
tggaaggcat acagctgagg gagagagcag ctgcaccctg gtcaatcccc cactcatttc    8700
cctggaggtg gggctgaggc acctggagca ctctgcttgc ttgggttgtc cctttgccaa    8760
agaatgccgg gcagaaagta gagaacaagc aggcccagga agcactagaa gtccctcatg    8820
ggtggacaga gctttacctt cggagctgtc acctcctgtg ttcctcccaa caaccctgtg    8880
aggcaggcgg gcaggctgag caggggactg tgccccgttg acagatgagg aaagcgaggc    8940
tcaggggaa gtgacttacc tgtggcgtcg cagctaggca gtagtggagc gggcacctgc    9000
ctccaggcct tcggatccca gctgccccag ggcgctgcct ctgaggtgct gtacgaggag    9060
gtgactcggg ccagctcatg agcaaaggag ctgccgggca ggaaggactc actccccagg    9120
gcctggcagg acggggggctg tcgcccgagg ctgacctggg ggtgcctggc ttccccaagc    9180
ttgcaggctt tgtctacatg agtctacaac aaccgattga acaatccatc agctgcttgg    9240
ccacaaaatg gttctgactg atcttgtcac tgccctgagt gtctagctgg gtcatctggg    9300
tgttgtggtt atacccacca actgctttgg tggaacgaaa ccgcggccga tctgaattca    9360
gatcggccgc gggatcattc ctggactcag attgttctga agaagcccag ttctgggtgg    9420
catcaagtgc ttgctagatg gggggcttgc cttgatccgg ctacacttgg aggtgacttg    9480
ttcttggacg gctacataca gaaagagaga agtgggatg agttccaaag gcatcctcga    9540
cttcggctgt ggccaccgga gggtagctcc tggcccaaca cggacttctc acctcccgcc    9600
cttggctctc tactgagctc cccctgctc cccaattcct cgccattccc ctcatttctc    9660
tgccctcagc ctggactgca gttcttctgg gaagctgccc caactcccta ggtctgtgct    9720
caccaagagc agatcacact ggactgaaat gccagctgat ttgtctcttc aagaaaattg    9780
gaagctcctg gaggtcaggg tccatgtctg cttttacact cagtgctctg tatgcaggcc    9840
tggcactgcc cacccttga caggtggtgc atattttgta gaaggaagga aggggccagg    9900
tggggtgggc tgggctggtg gcgggagcta gctcagcctc ttagattctc tacccgatgg    9960
atgtgacctg ggacagcaag tgagtgtggt gagtgagtgc agacggtgct ttgttcccct   10020
cttgtctcat agcctagatg gcctctgagc ccagatctgg ggctcagaca acatttgttc   10080
aactgaacgg taatgggttt cctttctgaa ggctgaaatc tgggagctga cattctggac   10140
tccctgagtt ctgaagagcc tggggatgga gagacacgga gcagaagatg gaaggtagag   10200
tcccaggtgc ctaagatggg gaatacatct cccctcattg tcatgagagt ccactctagc   10260
tgatatctac tgtggccaat atctaccggt acttttttgg ggtggacact gagtcatgca   10320
gcagtcttat ggtttaccca aggtcaggta ggggagacag tgcagtcaga gcacaagccc   10380
agtgtgtctg acccacccaa gaatccatgc tcgtatctac aaaaatgatt ttttctcttg   10440
taatggtgcc taggttcttt tattatcatg gcatgtgtat gttttcaac taggttacaa   10500
tctggcctta taaggttaac ctcctggagg ccaccagcct tcctgaaact tgtctgtgct   10560
gtccctgcaa ctggagtgtg cctgatgtgg cactccagcc tggacaagtg ggacacagac   10620
tccgctgtta tcaggcccaa agatgtcttc cataagacca gaagagcaat ggtgtagagg   10680
tgtcatgggc tacaataaag atgctgacct cctgtctgag ggcaagcagc ctcttctggc   10740
cctcagacaa atgctgagtg ttcccaagac taccctcggc ctggtccaat ctcatcccac   10800
tggtgcgtaa gggttgctga actcatgact tcttggctag cctgcaacct ccacggagtg   10860
ggaactacat caggcatttt gctaactgct gtatcctagg ccaataaatg ttgatcacat   10920
ttatagctgc catggtaggg tggggacccc tgctatctat ctgtggaggc tctgggagcc   10980
cctgacacaa actttctgaa gcagagcctc cccaacccct tttccattcc ctatacctga   11040
cagatggccc aggaacccat tagaaatgga aggtcactgc agcagtatgt gaatgtgcgt   11100
gtgggagaag ggcaggatca gagccctggg ggtgtggcag cccccaagtg attctaatcc   11160
agatcctagg gttgtttccc tgtcccattg aaatagctgc tttaaggggc ctgactcagg   11220
gaaatcagtc tcttgaatta agtggtgatt ttggagtcat ttagaccagg ccttcaattg   11280
```

- 16 -

```
ggatcctgct cttagagttg gatgaattat ttaactgatt ttcagatctc ctctttctca   11340
atgctttcag aagcacagta actgcttact ctgaaatgaa ttctcacccc acttccacat   11400
atgcacccct tgcccacccc tttgggaaca ctggccttaa ctgcttacct tcaaatggac   11460
tcatctgttg ggagatatat gcattctgcc gttcaggggt cattgccata agacctgatc   11520
tctgttcctc ttgctaaaca gaagatgaaa aagacaaatt agattacagc taccaattaa   11580
taattagcct taggatcgct gcgtggggac ctaggacttg gctttggtgc agcagaaagc   11640
atgaataaac acaccagcat acactcgcat gcatgcccca ccctctcgag caaaattcca   11700
caggtataaa taaagtaaga ttctgcacct gggttaaaaa cacaactgca acagcataga   11760
atggggcagg agagacagaa cttaatagca agagcacaca gaaaaaagtt ttaggcattt   11820
tggatgtcca tctgctcagg atgggtcagc agtgagatgc ggtcaccaaa agaacaaatg   11880
taacattagg ctgcattaat agaagcagag tatgtagaag gagggaggtg acagtcctat   11940
gctaactctg ccttggccag actataccca caggagtctg ggcatgccag tctcagggag   12000
acccagacag actggctgca ttcagaggat ggtaagtaat gagagtgggg attggacttc   12060
aaactaccca gacaaagaat ggctgagcaa gccaaggatg ctgtggctgg ggcagagcag   12120
actgtgggct atgtagtggt ggatacctag cctctgcagg gctgtcatag ggaaaggaca   12180
ttgagaagag gactgaggct tgttcctggt ggtcctggca tgaacggcca gatgatcaca   12240
tggtcaggtg gacacagtct ccaacactgg gagtagccaa acacttactg ccaacctccc   12300
gcccttctcc tgactagttg cagcataggc aattgggagg agcttcctgt ctccatctga   12360
aagctggctg ggtgggcagg gggaggagcg agccaagttt caaggccgca gtttcagcac   12420
tcagtctggg atcggctcaa ggagcaaagg ggaagaacat agccaggagg gaataacatg   12480
aaggccccca gacccagaaa aggcatgact tgctctgaga ccctcagccg gttggtgtca   12540
ggttgtgact cggatccagg tctgactccc agtccagtgc ttgaagcctc accccacaca   12600
gtgaggggag cccggccatc tctgctcaac tgctgccatc tctctcccct tctcaaccac   12660
caaggcagct ctgtctggga gcacaagctc caagtccact ttctggtctg tgtcccccccc   12720
aagatgccag aggacttgcc tctacaacac gggctgcccg tgcagtgcct gcttttccag   12780
caaagggctt ctgggaaccc ttctctgcac tcagtggggc tggtgggagt ggggcggggt   12840
agcgacccag tgcttgggac tgtgcccagc tctcaggcct ggcagcagtt cctggccttg   12900
gttcctgcca aggcagagag gacaaacaca tggcaccggg aagactacac cagaagcgat   12960
tccaccagac tggggtttgc ttttctatcc cgcccttagc ctgcttcctg tcctggtccc   13020
tgcctccccc tccactggag ctgccgtgtg ggcagtgagg ggctgtttct cagctgccct   13080
atggagctgc cctctccctg ccaaagcatt ggcaaggcgg caaggggtgg gggtggggat   13140
ggggggtggg atctgccttc tcaagctctc attatactga gcacgtctca cccattattt   13200
tatgtcatct agcaacaccc catgtggaca ctgaggagca tggggggtcac atgaccactg   13260
cccaaggcca caccatccgg atctgcctga gatggtcagg gttggcagcc atttctgaag   13320
gcagtccttt cgctttggct cttcttgtac cagtctcagg acatcagggc agaagatcta   13380
cagtccccag cttactgatg tgacagcaga ggctcagaga ggttaaatga cttgcccaag   13440
gtgacacggc taagaagtac agtatctcct aactgcagac caggtgcttc tgctgcttct   13500
ggggacagat tcctgcgtgg ctggctaggt ctaaacggtc cttaactcca tccccaccgg   13560
ttgctgcatt agtttcatca aataacacag ttgtacagag gtaggggttc aggggcaggg   13620
gcagatggag ctggagagt gtgactaagg aaacagcagg ggaagtgcgg taaagtccga   13680
agggagggac ggaaagagaa agccaagccc aggggcgtgc cagacaaaag gaaaggccac   13740
gccggggcag ggcaggcttc agcgggtgct ggggcgtctt catcccggga agcacacatt   13800
ccagaggacc ccggagtcta atggaaaagc tggccagcct atcactatgg aaactgccaa   13860
ggccacacag cgctacgcgt atttaaatgt gctggagtgt tgagatactg tagtggtggg   13920
atgcttaagt gctggggtgc tgggtgttgg gatgcctagg tgctggggtg ccgagatgct   13980
ggagtactag tgtgctggga tgctgaagtg ctggggtcct gagatgctgc agtgctaggg   14040
tgctgagatt ctgggctgct ggagtgttgg ggtgctggga tgctggagtg ctgagatgct   14100
tggacaatgg ggtgctggaa tactatggtg ctggggtgct ggggtattga gatgctaggg   14160
tactgggatg ctgaagtgct gagatcctgg agtgctgggc tgctgggcca caggctcttg   14220
aatccattcg tctgcccagg ggaagaaacc agaagataaa gagctaatga aggagctttg   14280
gttgagaggg aggaagtaat ggaaggagca acatcttgtg gaggagcagg agagaatgga   14340
cctcaggttg ggagagaggg ccaggctaca ggccagagag gcagaaggat tccagcagag   14400
tgtgggctcc aggagccaag gggaaacagg tttctgggag gagagagtcc agtactgctg   14460
aagtggcaag tccgctgagg accaggaagc ttcatttggc tttatgacca ggaggaattt   14520
ggaactgtga ctagagtact taggggggaag gaggcaagac tggagccaga ttgctctggg   14580
```

- 17 -

```
ttgagggggtg agtgggaggt gaagcagggc actgtcactc ctttgaaggg tggcagagag   14640
ctggaattgg tgctggatgg gctgtggggt gacagggtca tgtggaaagc ccctgggggg   14700
cacctggaaa aggagaagct gacagtacag tgagaggaca gctaagggaa agcggaatgg   14760
cagaacacgc actgccagga ggaatgagga tagggtcagg agtgccaggg gcagtgaggc   14820
cagcctgggg tcaggtggca ggacgtgtcc aggaagctgg tctgcactgc agcccacact   14880
ggctcagcct tgaggttccc tgtgtggttg gggtaggaag ttgaaccctc tgggaatgga   14940
agatggaacc agctctgcga gccaagctca gcttttatct atgggtctct gagggctggc   15000
agagctgagt ggggacaact gtgatccgtg aggctctcag gttgaggtgg ccctccggg   15060
agggcttcat tttcccagcg ggtaggttct aagcagcagt ggctgggcag gtgggtccaa   15120
cacagagcca gagaagggtg aatgggcctc ctggcacccc acccctgctg ccctgagct   15180
cagtgatgga gggggacagc acagctgagc ccaagtgctt tggtgtggcc ctgagggaaa   15240
gctgcagcct gcctggggcc tggcatggat gggacacttg aggcagaggg acaatagtgg   15300
gcgctgcagt gaggctggct cttggagagg tttcctgagg agtgctgcct gagacgggca   15360
gggagaacag agacaaagtt ggtgacaggg aatgaaagct gactgaagga ctttacccag   15420
acctatgagg atatctctct cagcaggaag caggagggga ctgtgtgagg actggccaag   15480
agctggagtg ttgggaaaat gactctttct ccgacccctc tgtcctagct ctggcccctg   15540
gactgcggag gtctgcttcc accccccattg gtcgatcgtt gtcccttgtc acagccattg   15600
agaattttgg cagggagcat gttcttagag cattttttagg ctctgcggga cataacagct   15660
ctgcctcaga gcacatgcct ttctcagctc ctgaaagcca ctgatcaaat tggaacattt   15720
tgtaccttag ggatgaggat atcaactctc ccagccactt agagggataa atgtgatgat   15780
gcattcaatt gtgactacat ctgatcccaa ctgttgcttc agctgctctc ctatagcaca   15840
tggcgggagg cgtgcatccc agtagctacc tccccacttt tggggagatg tggttccatc   15900
catgaaacct gggtacccgc ctaccaggtc ctggcctatc aggtggcagg gtctggtcaa   15960
agaagggcat gtgtggtctt cagcaaggga gacaggacgg tggtgcagag cgtctagacc   16020
ctcagggcaa gtctccccca cacctgctcc cggggcagtt gtctttgtga cctcccatcc   16080
ccctctgttt catcctctat aaaatgaggg gctgagcccc aaaataacag gcttctttgc   16140
catgatgcaa aactgctgaa tctttctttc tgacacacaa ggcatcgagc agcctctgaa   16200
agaaccaaag ccactagcag gcttcctgac ttgggtttgt aggtactgaa tactcccttg   16260
aaaaataaaa acatagaggc acttttctcc tggctgttta ttacagaacg aagaaaaaac   16320
acactggctt gaaacagacg ccagatttca aatgtagagg tgaaatacga ggtggcaatt   16380
aaaatgtgat tacagaaagt ctggacactg agaaaagttt acaggacagt gggtgtgggt   16440
tttctataac agacacttaa atatacatga cgataattgc agatagaaac catcaaagac   16500
aaaccccaaa tcaactaata atgtttacag atgttcccc ccaaaccaca gagccttaca   16560
tcaaaacaaa tactgaaagg cttttaaacca ggaacagctc gccttaaccc cacgagggtg   16620
cacacaagct gggctttttc tctcggtctg aatggtaaag ggaggaggat actctagctc   16680
ctccaggtgg attgctgaga cagggctcgg ctcacacact gtctctgcgc ctctcccaaa   16740
tctggagaac tctcccagcc tcctggtaaa gtgtctctgt ggggcactta acgataaaac   16800
agcttctgct gtaaagctca ttaggaaaga gctagcggag actgaaaggt tcgcaaaaga   16860
gattaagaat cacacaaggc aataggattt ttagtgaaca tagaaataaa tggccaagtg   16920
gttttctatt tggcatttgt caacttgcac aacaactctt ggtcatatcc acattgctca   16980
ttgcattaaa accataagcg actcagccac ctagcttaac aaggtatcac tggagcaaac   17040
aacacggtct gcatatttgt aacattgtat aataaacaca aaacaatgca tagtaaacac   17100
aactctactg aaacaaaagc cgtcgcttta tttacaaagt cacaaaatga agtataaata   17160
cttctgtcat taatgtttag gaaaaccatt tacaaaattt tcaaatatgt acacgtagct   17220
tgaaaaatca ccagctttcc attttgtcac aggtagagag agggataagc atgggctgac   17280
aacaccactc aaattgtaac gggagacaac tgcgggtatg gatcgacacc acttcctaga   17340
gtgatgtcac catgggggtt tctatgggca tcctgctcag atttaaagtg ccccagcatc   17400
ctgggtgact tgcccagaat tctgggctgt ggcattttga gcagcagcat gctgttccaa   17460
aatgtcgtcg atcagcctca agttgcacac ccagtcttca tctgggctca cacaggagcc   17520
tttcaagaga gcttcaatga aatctacctc attgcagtca ggtgacgaaa tcagatcatt   17580
tagtgggggt tggggctggc gcaaaaagtc ggcaggtggc agctcagggg gaatatccgt   17640
tctgtcgaac ggacctggga actggctggc agcaacggca gaagcagcag cagcggtggc   17700
agcagcagcc acatagcttg gtggctcgat gccctgtatg gggctcaggg gactaaagct   17760
ggccataccc tgctggagga acttggtggt gtttgctaca ggcaccgggc cctgtaccgg   17820
gctctgcctg aggctctggc tgcccagcag gctgaagctg gggttgttgg ccaggggcac   17880
```

- 18 -

```
ttgtgttccc atcgcagcgg gcacttgtgc ctcccaatca gatggcctct gaaggcaggc   17940
ctggccagaa ggtgagtgct gctgaacgct attatccact tggctgaggg gtgttttccc   18000
cgaaactgct gtggtcacag ctgctgccgc tgtgacccat gcagcattgt tgaacgcagt   18060
gggcattctt ggcacactag gccgtctgag ctggtgggga ctcaaggact gggtgcccag   18120
ggagctggga cagaacccag gcaggggcac ttctggtggg gtggccttgg ggctctgcat   18180
atgctggcag acagagtcaa gtctgcccag gggagtctgg cctgagtgtg agaggatggg   18240
acactggggg ctggaggtga aaattccttg ccgcttcccc agagttggtg agatcactcc   18300
catgcccggc gcgcgcgtcg acgtgagcaa gtggaatgga gtggcaggga atgagtgagg   18360
gagacaacag ctcagtagga ccttgtgggc tactggaaag actttggctt tgactctcag   18420
tgagataagg aggtatttga aggagtttta gcagagaagg aacaattctg tttattttta   18480
ggagctcttt atatatttag gaaattactt ctttgttagt catatatttt ggaatttgtt   18540
gttccccgtt tgtcatttct gtttctacat tttgcttata atatttgtct atgtaaacct   18600
taatatgtac ttggttaaat tgataaattc tttgcataat taatagctag ctattgttgg   18660
cctacctata attaattttt gctttatcta gtaataggcc tgaattttca tttgggatcc   18720
agccctctcc ctgacactat gcagggcctg ggagactaaa gcctgctgga aataactcca   18780
gcttggccct gccaaacatt acaacaccta gcacctgctc tccccaccat agtgactgat   18840
ttgggcagga atgagaccac agccactcca agagcccagc tgttggctac cagtaacatc   18900
ttctcctcta aacaggagat ccagctatat tgaaggcttc caaaattacc ctatgtctac   18960
ctgtcacagg aatgttcaga ggactaagcc tctgcctttc tccaccccat acttacttca   19020
tatggaacta tgaatgggca acttcacaat ttattattta cgtcacctag atgcaagtca   19080
gagggagaag caacaaatca gcagtaccta agaagttctc aagtcctcaa ggtgaacttt   19140
acctatatat acaaaatata tttgcctctt tcctttaacc cttttctta ctcccaccac   19200
tttccaccca atgtgtaata atattagtca cttcatagag ttcttatgag aagttaaatg   19260
aggaaatcat gtaaaccact gagggctggc aacaagttct taataagtgc tattgagtta   19320
tgagtattat tatctccctt gggctggatt cacagtgtca cctcttctgg gaccatagta   19380
agccaatggt tccagctcct tctattatgt cattttaatt tggggaatag cttaacatat   19440
tagatgatcc tttacatgcc tgagcggtct ttctttgatg gtatttctat gatcttatga   19500
agagctagat gttgccgctc cattttatct tgctggtggc agctggtgtt tagccaactt   19560
gtcttttttt ttctgtcttt atattttggg ttttgttttt tggcagaagc ctgtgttttt   19620
cagattactt tttgcttgtg tctactttt cccaaaacaa tattacatat taaacttatt   19680
gtatatttaa gtttatttta tgcatcaaaa gtcgcattga atttctgtgc tattgtgggg   19740
caaattgaca tcaatgtaat ttaactcatt ttatcccaaa ttaggctatg tctttccata   19800
tactcaaatc ttcttttatg tccctcaaca gtttccttca tataaatatt gcatatttct   19860
aattaagttt attttctaa tctccatttt ggatgtctta aatatagtct tttctccctt   19920
tgctctttat caaagatctg caaactatgg cctgttttg taaataaagt tttgtaataa   19980
agtttaaatg gccactccca tttgtttaca tgttgagtat ggctgctttc agactgaaat   20040
ggcgaatgaa gtggtcataa caagaccata tggcctggaa agcaaatata tttattatct   20100
ggcaatttac aaaaaaagtt tgccaacctc tgctttatat ttttgatcta gttgttattt   20160
gaaaataaag ctattgatat ttgtatatta atttttacc cagctacctt attgttttta   20220
ttacttaata gtttacagta tttctttag ttttccagg tgtaacatct gtaaatatta   20280
ataaatctat tagctaatat ttcatttagc attttatat ctatactcac atgagaagtt   20340
ttctttaatt ttctttgtg tttatcaacc tgtgttcact caggaaaatg aagccactta   20400
agtataccag gagtggaggg tttcatatag aaatgagggc ttatttgaat tttgggaaag   20460
ctgatgaaac aggtcagcag agttactgca gaagaccagg aaagttacat ctggaaggtt   20520
agggaagcag acactaaaga cttaagcctg aagcatagaa gtaaggatcc gtcaatactt   20580
attgagaaac ttctggaatt ctcaagaacc tctgagaaat ctcccattct gtggcaataa   20640
agtggtggta ctcaagccat caccaacatg gctcatatgt ctcattgcac tatgtccaaa   20700
gacaaatggc ctctgcttct cttctgtctc ctaaatctct taagatttcc tcttatttgt   20760
ttaagtctaa cccagaagac ttacatggca ggtaattctg ggaaatgtat tcccttgttt   20820
ctccaaaggg gtggggataa taccaagttg acaacagaaa atctagcacc ctttttaagg   20880
ttttggcatc agtgatttct tggtgctcta aatagttctt atgattattc catgggtgct   20940
taaaaagaat atgtattctc tgatttaaga atatgtaatt gatttaacta ttgattagat   21000
attaataaaa tagatttta aattacctta ttaatttggt taagtcctcc atgactactt   21060
attttttgac tatttgttat ggaaaggtgt agctaaataa atatagaact actctatatg   21120
tgtttctagt tctctatgta ttctctacat tttgctttat aattgttttc tttcttagag   21180
```

- 19 -

```
acaggggtct tgctgtgttg cccaggccag agtgcagtgg catgatcata actcactgta   21240
gccttaaact cctgggctca agcaatcctc ctgcctcagc ttctcaagta gatgggacta   21300
cagaagtgca tcaccacacc ctgctaattt ttttcttatt tttattttta gtgatggagt   21360
catgctatga tgctcagagt ggtcttgagc tcctggcctc aagcaatcct cccacctcag   21420
cccccctgagt agctgggatt ataggtgaga ggcaccatgc ctggatttgc tttataaatt   21480
ttgatatgtt acttggtgca tagatattca ttgctgttag accttcatta tgtgttgtac   21540
cctgcccttc tttggttcac ttttccttga attcagtctt gtctgatatt aattttcagc   21600
tgtctgcttt cttcttattt ccatttttct aatatgcttt tgcctactca tttgctttca   21660
attttttctg agtcatttca ttctagatga gtatattaca gtcagtactt aattgggttt   21720
ttctttgtca ctgaatatga gtgtctcttt tcctgtgtat tgatagggta gatatgtgta   21780
gtatgagtgt tacaatttt taaaaaactt tgatttctct cctttgtttt atttgggtc   21840
tccggttatt ttttaaggtg tatagtgtca ttttatttt aatgtttgcc tctgtaaaaa   21900
taattttata ggctgtactt aatcttctat ttatttagct agtttatatt gactcttcaa   21960
taacagtagt aaatgtccct acttctaact ccccttgccc tccacctttt aattttgtgg   22020
ggtatactac tggccttagt ttttctagtg gttaattta tacatttaaa taggtttata   22080
cctttaaac ttcaatggcc acctttaaaa atatttgac cccacccact ataaaaaata   22140
aacatgccat cttacacgca caatctcact ttctctcccc ttacattccc taattttac   22200
tgggtatttt aatatttctt catcatcgtg gttgattaca tttacatgta tattgcagtg   22260
gtagttccca taattgttat aacctttaac catagttcta catttatttt tgccaccgtt   22320
tttcccattc accttttggt tcaactttat cttctagtag tgtcttcaaa aaagtgttct   22380
tggaaactac agcccatgaa acattattgc atatttgaaa atatttatct gtcaccatta   22440
cacctgaatg acaatttagc tagctcaaat ttactggctc acatcatctt tttttggta   22500
attttttaag tacttctcta ctgtcatgta atgttgtatg taggatagcc taaagccaac   22560
ttgtgttttt ttattttgct gttatagtag tttgatcatt tttgcctaga tgccccatag   22620
gattattttt ctttgtcttt atttcaggaa accttactag actatggttc agtgctgact   22680
agacatttt ttccttaaga aacaccatgc cctttagatc cttagattca aatctttttt   22740
aatatcagta aagtttttaa atttacatat ttggatattt tatacttctc tagtttttct   22800
tcttaaagaa gaaaacatta attctgtctt tgcctgtctt ccatatctac aattttcttc   22860
taatcacttt ttataatttc catttcattt tgctcaattg cctcaaagct gctatctatt   22920
tttctgttgt caacaatctg tactcttaca tcagctacta tgataatatt gtgtcaccat   22980
ttactactat ttacaagcta accataattt ctctgatgat tttagttttc tcttctactt   23040
tgtgtcctag atacaggcag ctcaatttta attttgttg cttttcttga ttccttatac   23100
ctctgcatta agctcttaat tcacaaatta cttccattgt taagttattg agttcttaaa   23160
caaatatttg gtcatgattt tcatctactc cacatcaaaa tgttcatact gtgtaggctg   23220
tttgcctttt ttgtcctgct attttccacc attttgtgac atttttgtat ggatctcctt   23280
gttcgttttt tattattagt catccttgag tgagcagaaa tcttcctaga gcaggtattt   23340
gaaagaagta gtgtggaaga ggggctgggg ctgtgttctg cgttagtaga aaatccccta   23400
attcttagaa aaatccttta tgattcatgg tcttgtggga gaaggttgtg aagcgggttt   23460
tgtgaatgtg cttcatgtgc aatagagagt gactgagagg tggtttaacc tttcttctta   23520
gctcacaaag aatggctgct acagagctgc ttaacaccca cagttttct tctacatgct   23580
gcacatttac aaagatggag tatccgtgag ttttctcact cattcctacc tcccctgcca   23640
tttaaagta tccaaggaag ttgggagat tccctcagct aaacagccac ccagatctta   23700
ttgttccaaa caaaaaatta ttagatttgc cctctgagca ggtcacctac tttggagaat   23760
tttgtgctct gccagctctc ctcaagattt ggaaaagcag ttattttcta ttggagcccc   23820
catcactcca gtccaaagtt cactgcatgt gacatcccat cttatttgtc tggttcctga   23880
ttataggagt ttcccagttt caacaaaaat actgtctttg ttttttgtttc tcattcattt   23940
ttccccaatt ttgtttcaaa gcgaaaagta aaaacattct tactctaaca tcttaaaatt   24000
aatgtctggg aggaacctaa actgctcatt aatatatgcc atgctatatg tgatatggca   24060
gagactgcta cctgtccacc agaatctatt tatttttctt ggatgcacaa taagactaca   24120
tttcctagtc tcccttgcaa ttacatgtga ccatgtcatt aagatttagt ggatgaaatt   24180
taagcagaag caaggtgtgt aaattctagg gctggcccat tacaaacttt aacatgggca   24240
cctgtgtgtt tttcctttc tgcttaattg ggttggagat aatcacagtg atgctgaaag   24300
ccatgtgcta aagaaggcag agcctccttc tgcttgggct cctgaatgac tgtgtggaac   24360
agaggcccctt gccactcttg ggccattctg gattattaca tgcacaaaga gtaaagttct   24420
tttctgttaa gccattagat gtatgggttt atttgctgtt acagcctagt cgaacccaaa   24480
```

```
tgatgtagtg agggaggcag gacaaggaag aaacctattc agtatggagt tatccttagg   24540
gacaagttac aaaaattata aggatcagac accactgctg gttgatccat tatagaccag   24600
aataagcagg tggtatgatt ccagaaggag atgccatggt tgtgtgagag agagattaac   24660
cattcctata aacagaaggg tcaaagaaag tagccagtca ccagaatgct tatattaagg   24720
aggattgtga ctacctgtat ataaagtata ggaagaaaat ggggcagggc aattaagatg   24780
aattgcagac acaactattt gtgcatatta atttgaattt aaatttaaac ttaatttaag   24840
gataatttaa aggaaaatct tcccttacct atttcatgct gaaggggtct ttcaagttgt   24900
caaactctct ctatataaat aagactgcat aatccagacc ctccggaatc cagagatgaa   24960
ttgcatgtgg tagctgatgt gtgggaagcc cacagagcag cacttctggt cattgccatc   25020
cagctagctg gtgctctcag aagaatgaga tgaagaggca tgactttcaa gcttcctctg   25080
ccatacaagg tgagtttggg ttccaggctt cttcctagcc cctgtttctg cttcctctga   25140
tttaataccc agtcactgag tacctactaa acactcggca ttaaactgaa aagaacaggg   25200
aagtcaaaaa ccttttacca atgcctgatg ggataaagac atgacccatc cctcaaagag   25260
cttgtggtct tcccatggca atgcccttcc tccctaggcc agatggactg tgaagaacag   25320
cagtctcaag tggatttatt gggaagctca tgaagactca gctcaatggg ccatgtttgc   25380
aggggcccct tacaaggctc tgcacttgat tttgtaattt tgaattattt ttctcaaaaa   25440
ggcctcccaa attatgtaag cttcaggcct ttaaaacttg gatctgttcc cttgaagcca   25500
cataatctga tcagaaataa tttttcagggc tcattgggtg ctggagaatt catggttaga   25560
tatttaaata aaaatgcaga gaatctatag gactttccaa ctgagaccaa ggcttttttt   25620
ttctggtagc ttgactgcca ggaaacagaa agcggggcat ctccacctgc tggcagaaga   25680
ccaaaactac accatattgc attgaccgca gacatcaggc tttgtttcct tttaagtgaa   25740
taggtgaaat caatcaagca aactggaatt aggaaacaga aggaccactc acaaccgtac   25800
ctccacagca aagctaacac tttcattttg aataaccct ttccagcccc tgtttacatc   25860
agtcacattt tttgcatgga cataatagtg tttcaggcag tcctgctcta cagaaggcat   25920
ttgtttcgct gaccataagc atcttatgtg cttctacatt gtctttatag ccagctgtct   25980
gaagttctac atcatccgtc agtgatgggt cctgagtaaa ctcagcagtc tcctctaagt   26040
aacttgtata tatccctttt ataaagaatg ctgcagtggc caccctaag tatagaactt   26100
tgtctttccc aggcattact tacaggaaac tggggaccaa atgccactcc atagcatagc   26160
ttaggagaag tgagattcca aaggacagag tgggctggca catatgtagt agaagactgg   26220
acaaatgaga gtgaatgagc gagtctgttg tgagtggatg acacgcaatg caaccccaag   26280
ggccggctcc aatttgcaca gtccctaaaa catcccaggg atccagtctt atcgcagtct   26340
catcaacatt gacaataatc atttagagaa ttttcaccat gagactttg acactctgct   26400
ctgggatttt ggagttccaa ctgctttaac aatttataca gtcactcaaa tgtagaatcc   26460
agtgaattat taatgacaat tttgctccgc atattgaaag ggcattctat attaatcaat   26520
tataaatcat gataaattgc tttctaaaaa ttatacactt gaaacccaga aatgttcaag   26580
cccctcacca gtttacatac atccttaacc gtgtcttgtt aactgggtga ccaggaaaca   26640
gagaaaggag gatgtactta atgaataact ggccagaagt cggaagacct agatttttct   26700
cccatccctt ccatagattt gctctgtgac cctagacaat tcatatgccc cctctgttac   26760
catactttta agctgaaggg gttatagtgc atactttctg aggtccttct aacactggag   26820
atctatgagt tcataagatc acatagagtc ttggactttt cagagatcac taggcataag   26880
aaagccctcg aggacatcct cttcctagat caaccactcc aagctaagac cttaatgggt   26940
ctacactgtc atccatttat ataggagaga ggatggtaca agctaagtga aagtctgttg   27000
tcaactcagg aactagggta cagttccagc aatcaatctc catggagggt tagcagaggt   27060
ctggcctagc caattagggt ttggcactgc catatgctac tagaaaacac atgctttcat   27120
gccaggcaac agggtgggaa gtgcaatgcc attaaggacc ataccttagc ctacttaaac   27180
tagcctggga ttgagttact gagctcaaaa tacaattcag cacactttcc tgcccactgc   27240
aagtcaggcc agcccctgga gaactccagg gacaaggcaa gtctggagtt tgtccccaag   27300
gaactcccag tctagtggag gagatgggcc catagcagag ttacaaatgt ccaaaataag   27360
agcacaaatt cctgggttct taaagagagt tcaagcacac acacacagag agagagagag   27420
agagagagag agagagaaat taatttagat aaggaaggga ggtagggaga gatggtgcca   27480
gcaatggctt cctgaggaaa tgtcacttgt gatgggtctt ttaggtgagt tggacattga   27540
gagaaagtaa tcaaaagggc acaagatagg gtagctgtca ggtaaacaaa acaaaactgt   27600
atgcacaaag gtctagaggc aagaaagcat gggtgtgctt gcatagcaat gaagaatgtg   27660
gtttggccaa agcataggat tcacagaagg acctccccag gccatcagta gtctctcctt   27720
cgcaggagtc cactgtggct ggacgaggaa cagatcaaaa caggtcttgt ttgaggcttg   27780
```

- 21 -

```
gcccaacaac agggccagct gttgaccagg gcttccttca cccttagctt tctctccccc   27840
tagtgtagtc agagactcca aaggcagtcc cagagtgttg tgccaaaaca aatgcacatc   27900
aggctattgt catcaggagc ccttgtcttg ttctgtttgt tttaagaaga cataagtgaa   27960
ataaccaggt ttccgaagag agggcagaat tgggtttgtc cccagggaaa atgaggtttc   28020
tccaccatgg ctgttctccc catgcagcag cggccagggg tccccagcag ctctttgctc   28080
agtgcccctg atgctaggcc tgatgcttcc tatgtggtca gctcagatgt gcaacccttc   28140
tccatttta ttatttgagc aatataatca ttattgcttt tgttacccaa aatcttataa   28200
tcacccattt aagagtaatg taggaatcat tttctctttt tatttgatga actaatcttt   28260
ctggttggct cttgaggtgg gaggggtggg caatggggac cagcctgctt catctcactc   28320
tttcctaggc ctgctcctta ggcacgtgcc ccacaaatcc cacctccgca ggttggaaaa   28380
ggggcccaca gaggatctca ggtatctgag gaagggccag aggctatttg gcctgacatc   28440
ctggaacatc accagccagg agccataact cctttaggct agcctgcctg caactggatc   28500
aggtatagca aaaacgattg atctcacctt ctaattttca atgagtggga gtggctgcct   28560
tgagtgctgt gttgggaagg agtctgaggc agcatctgga ccctgtgtaa atatgcgttt   28620
cctgttattg atgaagcttt caagacaaga ttttagaaag ctttggctca agttgtaggt   28680
tgtgggagga aggaattagt aagagccatc ataaactcaa catctattgt gttccaggag   28740
ctgtgaccac tcccttcttt ttagtcggga aggtcaggat ctcactatgt cacctaggct   28800
agagtgcaat ggtgtgatta ttgctcattg tagtcttgaa tttgaattcc tgggctcaag   28860
taatcctcct gcctcagcct tctgagtagg tgggactact ggtgtgtgcc accacactcg   28920
gcttactcct ccctttgtat cctgctgcat cgttagtgca tgatacccac cacccctca   28980
gaggcccagc ctagtgctgt ctctcagaaa aacacccttt gagtcaacag agacaaactt   29040
aggggggtgcc tgactccaaa gtccaggcct tcctcctttg aggaacagca tggcttcccc   29100
agggaatatc attccatgga gacaaggcct gcagacagat ctcattttca tctgttcttt   29160
tactagccct tggaggattt gctccaaaaa cctgaggcac tgatgtttac tccagcttta   29220
cttcccccat acctggtgaa caactctggc ccagcttcca cacaccaagg cccatggctc   29280
taatagagcc agagaggcag tctcagctaa gaagagctgt atcctccagg gaccagcagg   29340
aacttccaga gatatcctac aagctccaac tgctgggaaa agcagactgg ggtcttcctc   29400
aggctccacc aaagatagcc aagtggcagc aatgacatga gcacctcatt cctgtcctag   29460
accctggcaa ttccatgaga gggaggctct gaattcacct ctgttcccag gatgtgtgac   29520
atcaatgcac attgtcatac cagatacacc tgccaaactt cagaacccct gggaagtgac   29580
cagaatgcca ctgaattcaa caccttagac caatgaacat gacctgggtc ctgtaggata   29640
ggaggcagca gcagtgtata cccagacctg gtcgactcga atagatctgc taggcgccaa   29700
gcttgtcagc cttaccagta aaaagaaaa cctattaaaa aaacaccact cgacacggca   29760
ccagctcaat cagtcacagt gtaaaaaagg gccaagtgca gagcgagtat atataggact   29820
aaaaaatgac gtaacggtta aagtccacaa aaaacaccca gaaaaccgca cgcgaaccta   29880
cgcccagaaa cgaaagccaa aaaacccaca acttcctcaa atcgtcactt ccgttttccc   29940
acgttacgta acttcccatt ttaagaaaac tacaattccc aacacataca agttactccg   30000
ccctaaaacc tacgtcaccc gccccgttcc cacgccccgc gccacgtcac aaactccacc   30060
ccctcattat catattggct tcaatccaaa ataaggtata ttattgatga tgttt       30115
```